



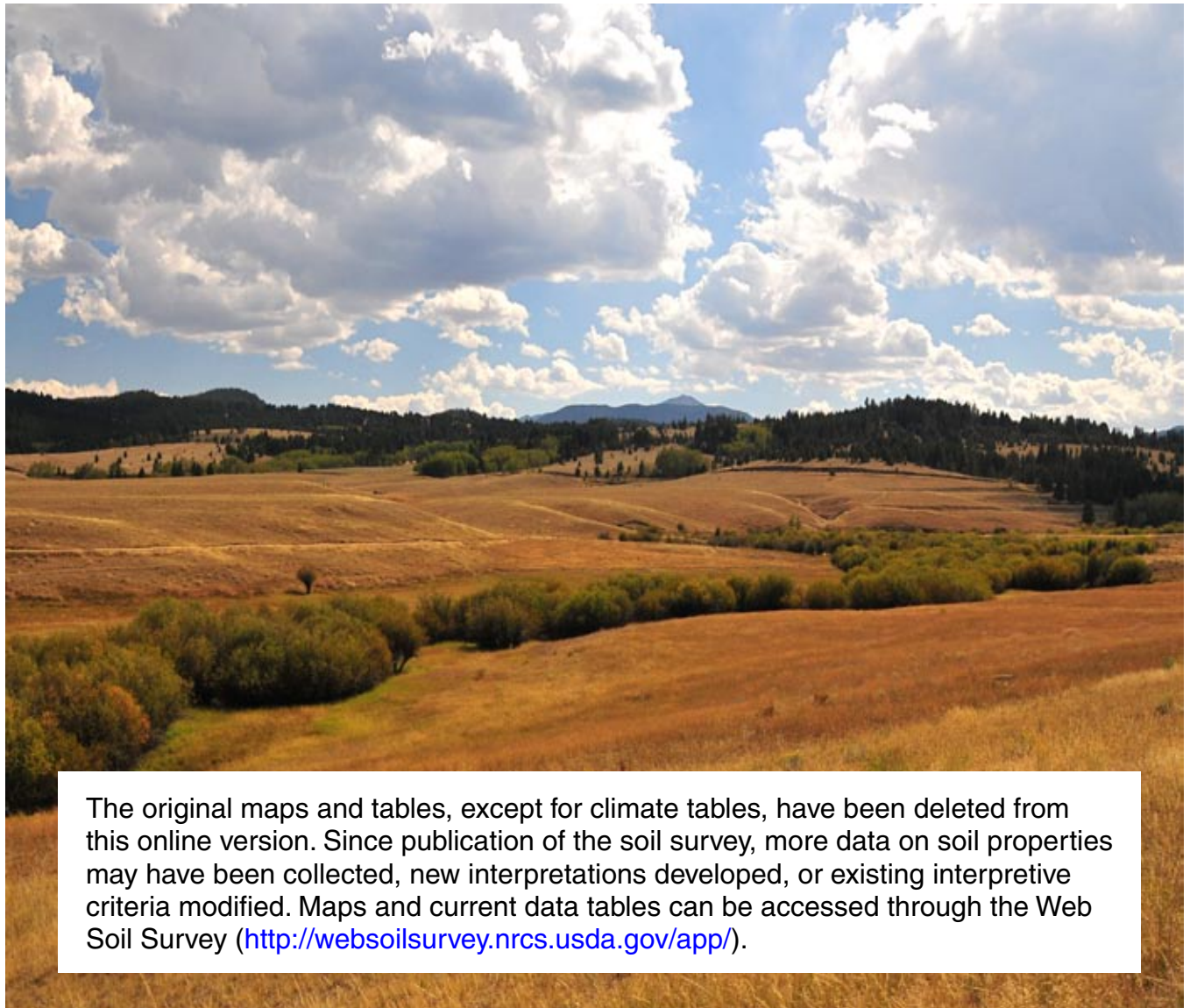
United States  
Department of  
Agriculture

In cooperation with the  
Montana Agricultural  
Experiment Station



Natural  
Resources  
Conservation  
Service

# Soil Survey of Silver Bow County Area and Parts of Beaverhead and Jefferson Counties, Montana



The original maps and tables, except for climate tables, have been deleted from this online version. Since publication of the soil survey, more data on soil properties may have been collected, new interpretations developed, or existing interpretive criteria modified. Maps and current data tables can be accessed through the Web Soil Survey (<http://websoilsurvey.nrcs.usda.gov/app/>).



# How to Use This Soil Survey

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The detailed soil maps can be useful in planning the use and management of small areas. You can access the detailed soil maps at the Web Soil Survey (<http://websoilsurvey.nrcs.usda.gov/app/>).

Go to the web site and follow the instructions to access the maps. Once the area of interest (AOI) has been selected, the “Soil Map” tab will provide a view of the detailed soil map and a legend that is hyperlinked to map unit descriptions. Click on the “Soil Data Explorer” tab to access the interpretations and reports. Report categories and subcategories include Suitabilities and Limitations for Use, Soil Properties and Qualities, and Soil Reports. Interpretive data can also be accessed at the Soil Data Mart (<http://soildatamart.nrcs.usda.gov/>).

See the [Contents](#) for sections of this publication that may address your specific needs.

## National Cooperative Soil Survey

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service has leadership for the Federal part of the National Cooperative Soil Survey. This survey was made cooperatively by the Natural Resources Conservation Service and the Montana Agricultural Experiment Station. The survey is part of the technical assistance furnished to the Mile High Conservation District.

Major fieldwork for this soil survey was completed in 2003. Soil names and descriptions were approved in 2007. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 2003. The most current official data are available at <http://websoilsurvey.nrcs.usda.gov/app/>.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

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## Citation

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## Cover Caption

View, facing east-southeast, from three miles south of MontanaTech of The University of Montana

Photo credit: Dennis Loreth

*Additional information about the Nation's natural resources is available online from the Natural Resources Conservation Service at <http://www.nrcs.usda.gov>.*

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# Foreword

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Soil surveys contain information that affects land use planning in survey areas. They include predictions of soil behavior for selected land uses. The surveys highlight soil limitations, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

Soil surveys are designed for many different users. Farmers, ranchers, foresters, and agronomists can use the surveys to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and homebuyers can use the surveys to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the surveys to help them understand, protect, and enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. The information in this report is intended to identify soil properties that are used in making various land use or land treatment decisions. Statements made in this report are intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://soils.usda.gov/sqi/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<http://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist ([http://soils.usda.gov/contact/state\\_offices/](http://soils.usda.gov/contact/state_offices/)).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. The location of each map unit is shown on the detailed soil maps. Each soil in the survey area is described, and information on specific uses is given. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.



Joyce Swartzendruber  
State Conservationist  
Natural Resources Conservation Service



# Soil Survey of Silver Bow County Area and Parts of Beaverhead and Jefferson Counties, Montana

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United States Department of Agriculture, Natural Resources Conservation Service,  
in cooperation with the  
Montana Agricultural Experiment Station

THE SOIL SURVEY OF SILVER BOW COUNTY AREA AND PARTS OF BEAVERHEAD AND JEFFERSON COUNTIES (fig. 1) is located near Butte, the location of a famous large base and precious metals mineral deposit. Bedrock geology in this area is dominated by rocks of the Boulder Batholith and associated volcanic and metamorphic rocks. Local valleys are dominantly fault-controlled structural basins that contain variable thicknesses of Tertiary sediments. Mountains found in this area are uplifted fault blocks that reflect the ongoing seismic activity of southwestern Montana. Arable soils are dominantly found on the Tertiary sediments of the valley floors with thinner soils found over bedrock in the surrounding mountains.

The areas of boulder-covered terrain found within the Boulder Batholith, and which give it its name, indicate that the area was once much more humid. The additional moisture and vegetation allowed a much deeper weathering profile to develop, especially along joints and faults. The humid period was followed by a drier period that resulted in poorer vegetative cover and allowed streams to remove the thick soil, leaving the unweathered boulders found between the joints on the mountain slopes.

## General Nature of the Survey Area

This section describes some of the environmental and cultural features that affect the use and management of soils in the survey area. These features are history and development, geomorphology, geology, groundwater resources, mineral resources, and climate.

## History and Development

Michael Garverich, Montana State Geologist, Natural Resources Conservation Service, prepared this section.

Prior to the passage of The Corps of Discovery through the Jefferson-Beaverhead Valleys to the southeast, the Rucker-Divide Valley was likely a well-used travel route between the eastern plains and the valleys to the west of the mountains. The gentle topography, lack of trees and boulders, and ample supplies of grass and water permitted easy travel across the Continental Divide. The importance of this area as a travel route continues today with a railroad (Union Pacific) and an interstate highway (I-15) following in the footsteps of Native Americans, trappers, prospectors, and other pioneers.

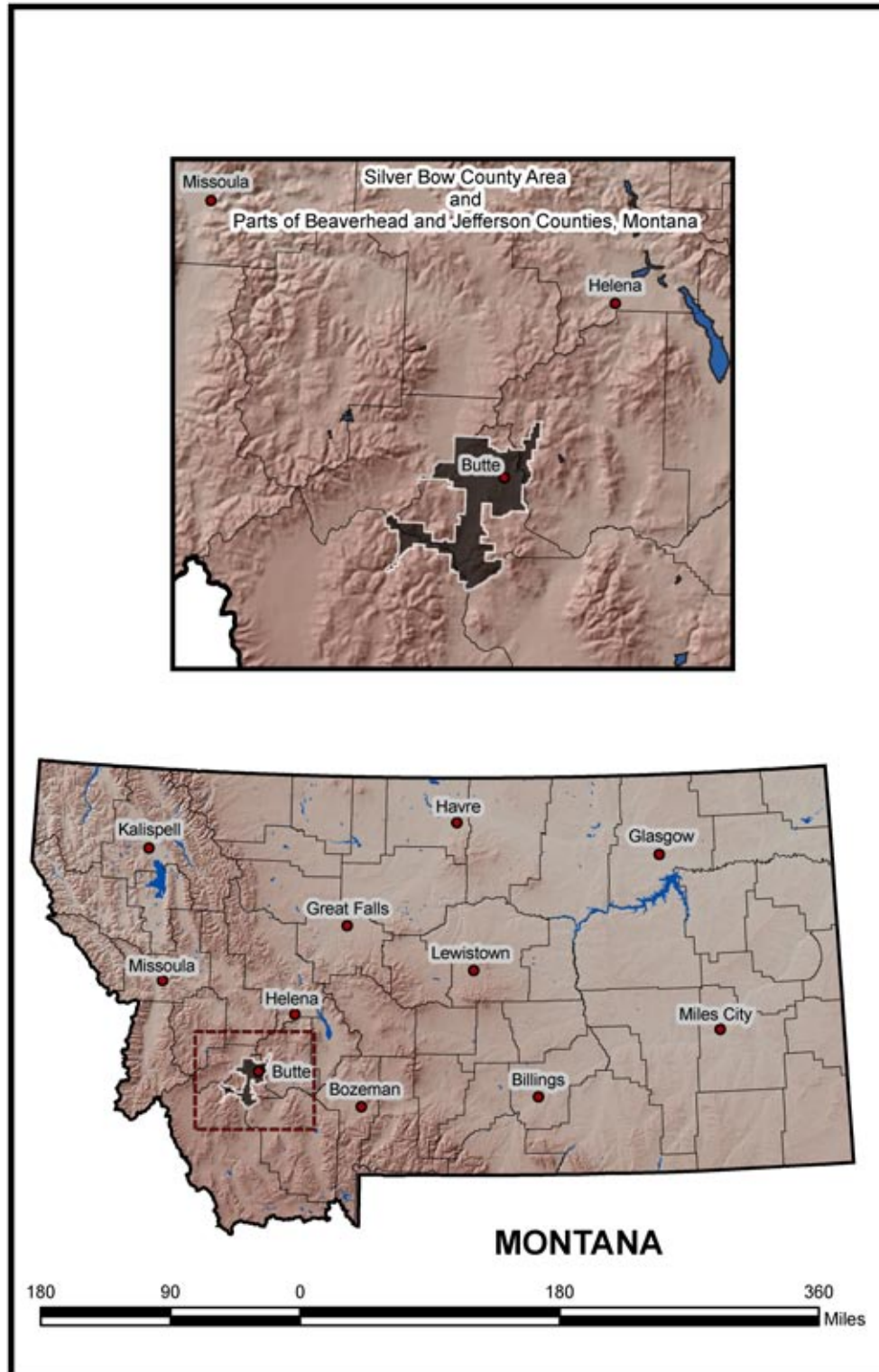


Figure 1--Location of Silver Bow County Area and Parts of Beaverhead and Jefferson Counties

Although bypassed by the The Corps of Discovery, the Rocker-Divide area was soon discovered and used as a passageway by early fur trappers. Regular use was discouraged by the Blackfeet who controlled the area to the east. With the coming of



prospectors and settlers, the route through the area became a popular trail between the mines of southwestern Montana and the Missoula area along with destinations in northern Idaho and Washington.

Although no early towns were established in this area, Deer Lodge was established just to the north. Gold was found along Silver Bow Creek as early as 1864 as prospectors fanned out from previous discoveries at Bannack and Alder Gulch. The town of Rucker was established to serve the diggings at Silver Bow Creek. Vestiges of the diggings can be seen on the hills to the south.

Within a few years, the vein outcrops at present-day Butte (established as Butte City in 1870) were recognized and developed for their silver content. Exploitation of the silver deposits was marginal until a mill using roasting and chloridization was built in 1876. The Colorado and Montana Smelter was completed in 1879, enabling the development of the great copper lode deposits. Additional support for mineral development arrived with the completion of the Utah and Northern Railroad in 1881. This railroad connected with the Union Pacific in Utah and provided economic transportation to and from the mines. Butte quickly became the major metropolitan and industrial center of the northern Rocky Mountains.

The mines provided a major portion of the United States' copper needs during early electrification of the country as well as other metals for industrial growth. The mineral deposits of Butte provided the foundation for the Anaconda Copper Mining Company, which led in the development of minerals geology, mining, and mineral processing technologies. This company became a major world supplier of base metals and dominated the political scene in Montana for many years. Improvements in minerals technology led to a gradual reduction in the workforce. The population of the area decreased from a peak of 100,000 to less than 40,000 today. The local population today is primarily supported by copper and molybdenum ore mining and processing, high purity silicon refining, college level education, environmental and engineering work, recreation, and government.

Agriculture has always been of relatively little importance in this area. Most of the land has poor agriculture potential due to elevation, lack of moisture, and soils with low productivity. The Elk Park area had a concentration of dairies during Butte's heyday, but all have disappeared, leaving a few distinctive barns. Some hay is still produced in Elk Park and along some of the local stream bottoms, such as Browns Gulch, Divide Creek, Big Hole River, and Camp Creek. Nonforested lands are generally used for grazing during the summer. Forested lands provide little timber because of low productivity, environmental concerns, and lack of demand. Much of the original old growth timber was logged at the turn of the twentieth century.

This area also continues to be a major transportation route with interstate highways and rail connections to two major east-west rail routes. Air service is limited.

## Geomorphology

Michael Garverich, Montana State Geologist, Natural Resources Conservation Service, prepared this section.

The Silver Bow Area is located in the Northern Rocky Mountains Physiographic Province. This area is characterized by narrow valleys and deeply dissected mountain ranges. Valleys have an external drainage provided by an irregular network of interconnected streams. Valleys also share geological and physical features found in the Basin and Range Province located to the south. Common features include down-faulted basins, upthrust adjoining mountain ranges, and a history of thrusting followed by extension.

All or part of the following fault-controlled valleys are within the soil survey area: Elk Park, Summit (Blacktail Creek), Deer Lodge, Rucker-Divide, Melrose, and Big Hole. Elk Park Valley is located northeast of Butte and has the highest elevation and most humid climate. The Continental Divide crosses its south end at 6,400 feet elevation, and Bison

Creek flows northward through the valley, exiting at about 6,250 feet elevation at the north end. This valley is dominantly native range and grass hay. Summit Valley extends southeast from Butte along the base of East Ridge. Blacktail Creek flows northwest through the valley, which is dominated by industrial and residential development. The extreme southeastern end of the Deer Lodge Valley is included in the area. This portion of the valley is drained by the upper reaches of the Clark Fork; included areas are dominantly native range. The Rocker-Divide Valley extends south from Rocker to the area near Divide. The Continental Divide crosses about the middle of the valley at an elevation of about 5,810 feet. Sand Creek flows north to Silver Bow Creek at an elevation of 5,300 feet. Divide Creek flows south to the Big Hole River at an elevation of about 5,350 feet. This valley is dominated by native range with a minor amount of residential and industrial development concentrated at the north end of the valley. The north half of the Melrose Valley is included in the soil survey area and is drained by the Big Hole River. This area is dominantly irrigated cropland with an increasing residential development component. Part of the Big Hole Valley extending west from Divide is also included in the soil survey area. This part is a narrow, youthful valley with limited irrigated croplands along a narrow floodplain. This stream valley likely has an origin as an overflow route from the Big Hole Basin as it filled during an earlier geologic time, possibly as early as the Pliocene.

These valleys are surrounded by low rounded mountains covered with a mixed Douglas-fir (*Pseudotsuga menziesii*) and lodgepole pine (*Pinus contorta*) forest with a few parks or clearings. Fleecer Mountain lies west of the Rocker-Divide Valley and has a rounded summit that extends above timberline to 9,436 feet elevation. East of the Rocker-Divide Basin is an area of low, rounded mountains graduating to the higher-relief Highland Mountains, at about 10,200 feet elevation. This range has a rugged, sharp profile due to past glaciation. East Ridge and its northern extension, Rampart Mountain, border Summit Valley to the east. The western, steeply dipping face of East Ridge reflects faulting along the western base, lifting the ridge in recent geological time. The well-defined western side of Elk Park also indicates the presence of a fault. Away from fault zones, the mountains near these valleys generally lack the rugged profile of many mountain ranges found in western Montana. The rounded profiles indicate lack of glaciation and deep weathering of uniform bedrock. The steep canyon walls and narrow valley of the Big Hole River above Divide indicate a relatively young valley or recent rejuvenation. At Maiden Rock, between Divide and Melrose, the Big Hole River cuts through resistant quartzite and soft Tertiary sediments in a meandering pattern that suggests that the river has been rejuvenated by some process relatively recently, and the present river has been imposed on the bedrock. The section of the Big Hole River from Divide to Wise River is actively downcutting as is indicated by the V-shaped section of the valley. Upstream of Wise River, the valley follows a rift valley of less resistant rocks, so the stream valley is slightly wider along this reach.

## Geology

Michael Garverich, Montana State Geologist, Natural Resources Conservation Service, prepared this section.

The geology of the Silver Bow area is dominated by rocks of the Boulder Batholith and rocks it intruded (the carapace). The Boulder Batholith is a large, composite body of plutonic igneous rocks. These coarsely crystalline rocks have mostly crystallized at considerable depth, but some of the individual intrusives were at a depth shallow enough for the development of pegmatites. The intrusives differ in composition from granite, to monzonite, to diorite, but all are similar to granite in appearance, weathering, soil development, and mechanical properties so will be referred to collectively as granite in this report. These rocks formed during Cretaceous time and weather into a coarse sandy soil called grus. Dominant vegetation is generally

Douglas-fir and lodgepole pine with parks dominated by grasses, forbs, and sagebrush.

The northern end of the Rocker-Divide Basin is bordered by Tertiary Lowland Creek Volcanics. This unit is composed of rhyolitic to dacitic flows and tufts, which are volcanic extrusive rocks and likely represent the final igneous phase of the Boulder Batholith emplacement. These volcanic rocks tend to weather into sandy loam soils. Grasslands with sparse juniper are typical. In the area west of Rocker, juniper trees commonly exhibit a columnar form thought to be caused by excess carbon dioxide or other atmospheric pollutants. This form also occurs east of Billings and near burning coal beds in the Powder River Basin.

Elk Park and Summit valleys are underlain by Quaternary alluvium composed dominantly of sand from weathering of the surrounding granite bedrock. These valleys have low stream gradients and are areas of active sediment accumulation. The Rocker-Divide Valley is underlain by rocks of the Tertiary Bozeman Group of Miocene and Pliocene Age (24 to 1.8 million years old). These rocks represent basin-fill sediments deposited during earlier fault basin development when western Montana was an area of arid, fault-controlled basins with little or no external drainage, much like modern-day Nevada. Near the end of Pliocene time, the local climate became more humid, and the basins, having become nearly full of sediments, overflowed to develop the present-day external drainage system. The Bozeman Group sediments are composed of mostly sands and gravels with more or less silt and clay. A few debris-flow beds containing boulders up to 10 to 12 feet in maximum dimension are present, especially in the northern part of the basin. The debris-flow beds are poorly cemented and have been tilted by later faulting. The Melrose Valley has Quaternary alluvium over Bozeman Group sediments and is a continuation of the Rocker-Divide Basin that has likely been lowered by erosion. The Big Hole Valley above Divide is underlain by Quaternary alluvium over bedrock.

Cretaceous-age sediments border the southern part of the western side of the Rocker-Divide Basin and the western side of the Melrose Basin. These sediments are mostly soft sandstone, siltstone, and shale and weather into clay-rich soils. These bedrock units tend to have a grass-and-shrub vegetative cover with a few scattered trees, such as juniper.

In the Big Hole River Canyon at Maiden Rock, from Dewey to Wise River and east of Melrose, the river has cut through various rocks of the Paleozoic Period. These rocks are dominantly resistant limestone and quartzite and tend to form steep outcrops or skeletal soils. Limestone tends to weather into calcareous soils. Formations exposed in this area include the Phosphoria, Snowcrest Range Group, Quadrant, and Madison Group.

In the area east of Maiden Rock, the Tertiary valley-fill sediments are bordered by rocks of the Newlan Formation, part of the Belt Supergroup. The Newlan Formation in this vicinity is composed of argillite, siltite, and minor amounts of limestone. These rocks weather into loamy skeletal soils.

## Groundwater Resources

Michael Garverich, Montana State Geologist, Natural Resources Conservation Service, prepared this section.

Alluvium and basin-fill sediments commonly produce an adequate volume and quality of water for domestic, stockwater, and light industrial purposes from shallow to moderate depth, 25 to 300 foot, wells. Volcanic (Lowland Creek) and plutonic (Boulder Batholith) rocks require fractured rocks to produce groundwater. Enough fractures are generally found within a 300 foot depth to provide an adequate volume of good quality water for domestic and stockwater purposes. Wells will occasionally fail to intercept fractures; moving the site a few feet in any direction will usually result in adequate flows. Groundwater in the vicinity of Butte and in some areas along the Clark Fork

Valley (Silver Bow Creek) may be contaminated by heavy metals from mining and related activities.

## Mineral Resources

Michael Garverich, Montana State Geologist, Natural Resources Conservation Service, prepared this section.

The Summit Valley District (Butte) is the location of a world-class copper, molybdenum, and base and precious metals deposit. The district ranks as one of the top 10 deposits in the United States for copper, silver, lead, zinc, and manganese. In 1864, placer gold was discovered in the district. By 1874, the importance of the silver deposits was recognized. By 1879, copper became the target for development with the completion of effective smelters. Copper output reached its peak in 1917 during exploitation of the large Main Stage Veins for which the district is famous. Copper and silver were later followed by zinc and manganese. Current open-pit production is from disseminated, porphyry style copper and molybdenum mineralization.

Limited areas of placer mining for gold are found in the northern part of the Rocker-Divide Valley. These areas were likely expensive to mine due to lack of nearby water supplies and not very productive. The old, unreclaimed excavations are still visible from local roads. In this area, near the intersection of interstates 90 and 15, is an area of gossan (oxidized iron minerals), an alteration that has been heavily prospected but nonproductive. A minor amount of hard-rock silver and lead mining took place in the area east of Melrose, but there are no active mines in this area at this time (2009). Small areas of placer mining and hard-rock prospecting took place along parts of Camp Creek east of Melrose and at Moose Town on Moose Creek. Glendale, located on Trapper Creek west of Melrose, was the site of an early silver-lead smelter. This smelter served area mines, mostly located farther west in the Pioneer Mountains at Hecla. For many years, phosphate was mined in the area of Maiden Rock. Phosphate ore was shipped to near Rocker where elemental phosphorus and other products were made. These operations have been closed and mostly reclaimed. Quartzite from the Quadrant Formation was also mined at Maiden Rock for use as a flux for the phosphorus operations.

## Climate

Natural Resources Conservation Service, National Water and Climate Center, Portland, Oregon, prepared this section.

Climate data are provided in the tables "[Temperature and Precipitation](#)," "[Freeze Dates in Spring and Fall](#)," and "[Growing Season](#)." The data were recorded at Butte FAA Airport in the period 1971 to 2000.

The "Temperature and Precipitation" table gives data on temperature and precipitation for sites within the survey area. The "Freeze Dates in Spring and Fall" table shows probable dates of the last freeze in spring and the first freeze in fall. The "Growing Season" table provides data on the length of the growing season.

Thunderstorm days, relative humidity, percent sunshine, and wind information are estimated from the first-order station at Butte and various climate atlases.

In summer, the average temperature is 60 degrees F. The average daily maximum summer temperature is 76.4 degrees F. The highest temperature on record, which occurred on June 30, 2000, was 100 degrees F.

In winter, the average temperature is 19.2 degrees F. The average daily minimum winter temperature is 7.1 degrees F. The lowest temperature on record, which occurred on December 23, 1983, was -52 degrees F.

Growing-degree days are shown in the table "Temperature and Precipitation." They are equivalent to "heat units." During the month, growing-degree days accumulate by the amount that the average temperature each day exceeds a base temperature

(40 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The average annual precipitation from the first-order station at Butte is about 12.86 inches. Of this amount, 4.94 inches, or 38 percent, usually falls during June through August. The growing season for most crops falls within this period. The heaviest 1-day rainfall during the period of record was 3 inches on June 8, 1913. Thunderstorms occur on about 27 days each year, and most occur in July.

The average seasonal snowfall from the Butte station is 61.1 inches. The greatest snow depth at any one time during the period of record was 27 inches, recorded on December 28, 1996. On average, 107 days of the year have at least 1 inch of snow on the ground. The number of such days varies greatly from year to year. The heaviest 1-day snowfall on record was 30 inches, recorded on October 10, 1911.

The average relative humidity at Butte in midafternoon is about 53 percent. Humidity is higher at night, and the average at dawn is about 85 percent. The sun shines 66 percent of the time in summer and 36 percent in winter. The prevailing wind is from the southwest. Average wind speed is highest, 9.4 miles per hour, in April.

## How This Survey Was Made

This survey was made to provide information about the soils and miscellaneous areas in the survey area. The information includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends up to 2 meters deep from the surface down into the unconsolidated material in which the soil formed.

The soils and miscellaneous areas in the survey area are in a pattern related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape transition to another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to record boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists.

Dryland small-grain yields (spring wheat, winter wheat, oats, and barley), as presented in the certified soils database and related publications in Montana, are generated using a Crop Yield Model (MT-CYM). This model is based on Montana Agricultural Experiment Station Report 35 (AES-35). AES-35 was revised, verified, and tested to encompass all dryland-cropped soils in the state from 1990 to the present, as the MT-CYM was programmed and maintained in the NRCS soils database. The resulting model consistently generates credible yields that are stored not as traditional data but generated as the soils data is certified and, subsequently, included as interpretation results.

Crop yields provided in this publication other than for dryland small grains are database stored and gathered more traditionally, through yield reporting, farmer interviews, and other yield studies.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods, but they are less predictable year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the context of climate and vegetation in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in recording boundaries.

# Detailed Soil Map Units

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The map units delineated on the detailed soil maps in this survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class, there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Some minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They are not mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The contrasting components are mentioned in the map unit descriptions. A few areas of minor components may not have been observed, and, consequently, they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all of the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. All the soils of a series have major horizons that are similar in composition, thickness, and arrangement. The soils of a given series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase

commonly indicates a feature that affects use or management. For example, Monaberg loam, 4 to 15 percent slopes, bouldery is a phase of the Monaberg series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

This survey includes *complexes*. They consist of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Savenac-Bridger complex, 4 to 15 percent slopes is an example.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Water is an example.

The “Acreage and Proportionate Extent of the Soils” table gives the acreage and proportionate extent of each map unit. Other tables give properties of the soils and the limitations, capabilities, and potentials for many uses. The “[Glossary](#)” defines many of the terms used in describing the soils.

## **10A—Slickens-Aquic Cumulic Haplustolls, occasionally flooded-Aridic Ustifluvents, occasionally flooded complex, 0 to 2 percent slopes, severely impacted**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Field investigation intensity:* Order 2

*Elevation:* 4,700 to 5,450 feet

*Mean annual precipitation:* 11 to 13 inches

*Frost-free period:* 70 to 100 days

### **Component Description**

#### **Slickens**

*Composition:* 50 percent

*Definition:* Slickens are accumulations of fine-textured material, such as that separated in placer mine and ore mill operations. Slickens from ore mills consist largely of freshly ground rock that commonly has undergone chemical treatment during the milling process.

#### **Aquic Cumulic Haplustolls, severely impacted and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Flood plain

*Slope:* 0 to 2 percent

*Elevation:* 4,700 to 5,100 feet

*Effective annual precipitation:* 11 to 13 inches

*Frost-free period:* 70 to 100 days

*Surface layer texture:* Fine sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Somewhat poorly drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* Occasional

*Water table:* Present

*Available water capacity:* Mainly 6.3 inches



*Typical profile:*

- A1—0 to 0 inches; fine sandy loam
- A2—0 to 10 inches; fine sandy loam
- A3—10 to 30 inches; loam
- C—30 to 38 inches; sandy loam
- 2C—38 to 60 inches; very gravelly sand

**Aridic Ustifluvents, severely impacted and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Flood plain

*Slope:* 0 to 2 percent

*Elevation:* 4,700 to 5,100 feet

*Effective annual precipitation:* 11 to 13 inches

*Frost-free period:* 70 to 100 days

*Surface layer texture:* Fine sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Moderately well drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* Occasional

*Water table:* Present

*Available water capacity:* Mainly 5.9 inches

*Typical profile:*

- Oi—0 to 1 inches; slightly decomposed plant material
- C1—1 to 1 inches; fine sandy loam
- C2—1 to 9 inches; fine sandy loam
- Ab—9 to 30 inches; stratified loamy sand to loam
- C3—30 to 42 inches; stratified loamy sand to loam
- 2C—42 to 60 inches; very gravelly loamy sand

**Additional Components**

Aeric Fluvaquents, severely impacted and similar soils: 5 percent

Aquic Haplustolls, severely impacted and similar soils: 3 percent

Riverwash: 2 percent

**11A—Mannixlee-Bonebasin complex, 0 to 4 percent slopes, frequently flooded**

**Map Unit Setting**

*Interpretive focus:* Riparian

*Elevation:* 5,410 to 5,740 feet

*Mean annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

**Component Description**

**Mannixlee and similar soils**

*Composition:* 60 percent

*Geomorphic description:* Flood plain

*Slope:* 0 to 4 percent

*Elevation:* 5,410 to 5,740 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Silt loam

*Depth to restrictive feature:* None noted

*Drainage class:* Poorly drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* Frequent

*Water table:* Present

*Available water capacity:* Mainly 6.2 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

A—2 to 19 inches; silt loam

Bw—19 to 28 inches; loam

2Cg—28 to 60 inches; gravelly loamy sand

#### **Bonebasin and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Flood plain

*Slope:* 0 to 1 percent

*Elevation:* 5,410 to 5,740 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Very poorly drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* Frequent

*Water table:* Present

*Available water capacity:* Mainly 4.8 inches

*Typical profile:*

A—0 to 10 inches; loam

Cg—10 to 24 inches; loam

2C—24 to 60 inches; very gravelly coarse sand

#### **Additional Components**

Meadowcreek and similar soils: 6 percent

Bonebasin, ponded and similar soils: 4 percent

### **12A—Riverrun, occasionally flooded-Mannixlee, frequently flooded complex, 0 to 4 percent slopes**

#### **Map Unit Setting**

*Interpretive focus:* Riparian

*Elevation:* 5,310 to 5,580 feet

*Mean annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

#### **Component Description**

##### **Riverrun and similar soils**

*Composition:* 50 percent

*Geomorphic description:* Flood plain

*Slope:* 1 to 4 percent

*Elevation:* 5,310 to 5,580 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Somewhat poorly drained  
*Parent material:* Alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* Occasional  
*Water table:* Present  
*Available water capacity:* Mainly 3.6 inches  
*Typical profile:*  
    A—0 to 5 inches; loam  
    C1—5 to 21 inches; gravelly coarse sandy loam  
    C2—21 to 60 inches; very gravelly sand

**Mannixlee and similar soils**

*Composition:* 35 percent  
*Geomorphic description:* Flood plain  
*Slope:* 0 to 2 percent  
*Elevation:* 5,310 to 5,580 feet  
*Effective annual precipitation:* 12 to 14 inches  
*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Silt loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Poorly drained  
*Parent material:* Alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* Frequent  
*Water table:* Present  
*Available water capacity:* Mainly 6.2 inches  
*Typical profile:*  
    Oi—0 to 2 inches; slightly decomposed plant material  
    A—2 to 19 inches; silt loam  
    Bw—19 to 28 inches; loam  
    2Cg—28 to 60 inches; gravelly loamy sand

**Additional Components**

Bonebasin and similar soils: 8 percent  
Dutton and similar soils: 5 percent  
Water: 2 percent

**15B—Anamac-Varney-Rivra, rarely flooded complex,  
0 to 6 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,350 to 5,860 feet  
*Mean annual precipitation:* 12 to 14 inches  
*Frost-free period:* 70 to 90 days

**Component Description**

**Anamac and similar soils**

*Composition:* 60 percent  
*Geomorphic description:* Stream terrace

*Slope:* 2 to 4 percent  
*Elevation:* 5,350 to 5,860 feet  
*Effective annual precipitation:* 12 to 14 inches  
*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 7.0 inches  
*Typical profile:*  
    A—0 to 8 inches; loam  
    Bw—8 to 15 inches; loam  
    Bk1—15 to 28 inches; loam  
    Bk2—28 to 38 inches; gravelly loam  
    C—38 to 60 inches; very gravelly sandy loam

**Varney and similar soils**

*Composition:* 20 percent  
*Geomorphic description:* Toeslope on hill  
*Slope:* 2 to 6 percent  
*Elevation:* 5,350 to 5,860 feet  
*Effective annual precipitation:* 12 to 14 inches  
*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Tertiary valley fill alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 6.8 inches  
*Typical profile:*  
    A—0 to 7 inches; loam  
    Bt—7 to 18 inches; gravelly sandy clay loam  
    Bk—18 to 48 inches; gravelly sandy loam  
    C—48 to 60 inches; gravelly loamy coarse sand

**Rivra and similar soils**

*Composition:* 15 percent  
*Geomorphic description:* Drainageway  
*Slope:* 0 to 2 percent  
*Elevation:* 5,350 to 5,860 feet  
*Effective annual precipitation:* 12 to 14 inches  
*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Gravelly sandy loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* Rare  
*Available water capacity:* Mainly 3.1 inches

*Typical profile:*

- A—0 to 8 inches; gravelly sandy loam
- C1—8 to 43 inches; gravelly loamy coarse sand
- C2—43 to 60 inches; gravelly coarse sand

**Additional Components**

Riverwash: 5 percent

**21C—Kilgore, occasionally flooded-Foolhen, rarely  
flooded-Philipsburg complex, 2 to 12 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Riparian

*Elevation:* 5,400 to 6,120 feet

*Mean annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

**Component Description**

**Kilgore and similar soils**

*Composition:* 40 percent

*Geomorphic description:* Flood plain

*Slope:* 2 to 4 percent

*Elevation:* 5,400 to 6,120 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Silt loam

*Depth to restrictive feature:* None noted

*Drainage class:* Poorly drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* Occasional

*Water table:* Present

*Available water capacity:* Mainly 6.4 inches

*Typical profile:*

- Oi—0 to 2 inches; slightly decomposed plant material
- A—2 to 19 inches; silt loam
- Ag—19 to 29 inches; loam
- 2Cg—29 to 38 inches; gravelly sandy loam
- 2C—38 to 60 inches; very gravelly coarse sand

**Foolhen and similar soils**

*Composition:* 25 percent

*Geomorphic description:* Drainageway

*Slope:* 2 to 8 percent

*Elevation:* 5,400 to 6,120 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Somewhat poorly drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* Rare

*Water table:* Present

*Available water capacity:* Mainly 9.5 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

A—2 to 13 inches; loam

Bw—13 to 26 inches; loam

C1—26 to 39 inches; sandy clay loam

C2—39 to 60 inches; sandy clay loam

### **Philipsburg, wet and similar soils**

*Composition:* 20 percent

*Geomorphic description:*

- Toeslope on hill
- Footslope on hill

*Slope:* 4 to 12 percent

*Elevation:* 5,400 to 6,120 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Moderately well drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Water table:* Present

*Available water capacity:* Mainly 9.2 inches

*Typical profile:*

A—0 to 9 inches; loam

Bt—9 to 22 inches; clay loam

Bk—22 to 40 inches; gravelly loam

BC—40 to 44 inches; gravelly loam

C—44 to 60 inches; gravelly loam

### **Additional Components**

Mooseflat and similar soils: 8 percent

Minestope, very stony and similar soils: 4 percent

Highrye and similar soils: 3 percent

## **22B—Philipsburg loam, 1 to 4 percent slopes, stony**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,560 to 5,970 feet

*Mean annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Philipsburg, stony and similar soils**

*Composition:* 85 percent

*Geomorphic description:*

- Alluvial fan
- Stream terrace

*Slope:* 1 to 4 percent

*Elevation:* 5,560 to 5,970 feet  
*Effective annual precipitation:* 14 to 16 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Loam  
*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 37 to 117 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 9.2 inches  
*Typical profile:*  
A—0 to 9 inches; loam  
Bt—9 to 22 inches; clay loam  
Bk—22 to 40 inches; gravelly loam  
BC—40 to 44 inches; gravelly loam  
C—44 to 60 inches; gravelly loam

#### **Additional Components**

Adel and similar soils: 10 percent  
Philipsburg, very stony and similar soils: 5 percent

### **24B—Kilgore, occasionally flooded-Mooseflat, rarely flooded-Philipsburg complex, 0 to 6 percent slopes**

#### **Map Unit Setting**

*Interpretive focus:* Riparian  
*Elevation:* 5,680 to 5,970 feet  
*Mean annual precipitation:* 14 to 17 inches  
*Frost-free period:* 50 to 70 days

#### **Component Description**

##### **Kilgore and similar soils**

*Composition:* 45 percent  
*Geomorphic description:* Flood plain  
*Slope:* 0 to 4 percent  
*Elevation:* 5,680 to 5,970 feet  
*Effective annual precipitation:* 14 to 17 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Silt loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Poorly drained  
*Parent material:* Alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* Occasional  
*Water table:* Present  
*Available water capacity:* Mainly 6.4 inches  
*Typical profile:*  
Oi—0 to 2 inches; slightly decomposed plant material  
A—2 to 19 inches; silt loam  
Ag—19 to 29 inches; loam  
2Cg—29 to 38 inches; gravelly sandy loam  
2C—38 to 60 inches; very gravelly coarse sand

**Mooseflat and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Flood plain

*Slope:* 0 to 2 percent

*Elevation:* 5,680 to 5,970 feet

*Effective annual precipitation:* 14 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Mucky silt loam

*Depth to restrictive feature:* None noted

*Drainage class:* Very poorly drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* Rare

*Water table:* Present

*Available water capacity:* Mainly 3.1 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

Oe—2 to 8 inches; moderately decomposed plant material

A—8 to 12 inches; mucky silt loam

Bg—12 to 18 inches; sandy loam

BCg—18 to 26 inches; very gravelly loamy sand

2Cg—26 to 60 inches; very cobbly loamy coarse sand

**Philipsburg, wet and similar soils**

*Composition:* 15 percent

*Geomorphic description:*

- Alluvial fan
- Footslope on hill
- Toeslope on hill

*Slope:* 2 to 6 percent

*Elevation:* 5,680 to 5,970 feet

*Effective annual precipitation:* 14 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Moderately well drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Water table:* Present

*Available water capacity:* Mainly 9.2 inches

*Typical profile:*

A—0 to 9 inches; loam

Bt—9 to 22 inches; clay loam

Bk—22 to 40 inches; gravelly loam

BC—40 to 44 inches; gravelly loam

C—44 to 60 inches; gravelly loam

**Additional Components**

Foxgulch and similar soils: 10 percent



## **25D—Work, stony-Adel-Kilgore, rarely flooded complex, 2 to 15 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,350 to 6,280 feet

*Mean annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Work, stony and similar soils**

*Composition:* 50 percent

*Geomorphic description:*

- Backslope on hill
- Footslope on hill

*Slope:* 4 to 15 percent

*Elevation:* 5,350 to 6,280 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 33 to 67 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 8.0 inches

*Typical profile:*

A—0 to 7 inches; loam

Bt—7 to 16 inches; clay loam

Bk—16 to 42 inches; loam

BCK—42 to 60 inches; gravelly sandy loam

#### **Adel and similar soils**

*Composition:* 25 percent

*Geomorphic description:* Terrace

*Slope:* 2 to 6 percent

*Elevation:* 5,350 to 6,280 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 9.5 inches

*Typical profile:*

A1—0 to 9 inches; loam

A2—9 to 18 inches; loam

Bw—18 to 33 inches; gravelly loam

C—33 to 60 inches; gravelly loam

**Kilgore and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Drainageway

*Slope:* 2 to 4 percent

*Elevation:* 5,350 to 6,280 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Silty clay loam

*Depth to restrictive feature:* None noted

*Drainage class:* Poorly drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* Rare

*Water table:* Present

*Available water capacity:* Mainly 6.4 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

A—2 to 19 inches; silty clay loam

Ag—19 to 29 inches; loam

2Cg—29 to 38 inches; gravelly sandy loam

2C—38 to 60 inches; very gravelly coarse sand

**Additional Components**

Foolhen and similar soils: 5 percent

**26C—Mooseflat, occasionally flooded-Bridger-Kilgore,  
rarely flooded complex, 0 to 8 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Riparian

*Elevation:* 5,560 to 6,250 feet

*Mean annual precipitation:* 16 to 19 inches

*Frost-free period:* 30 to 50 days

**Component Description**

**Mooseflat and similar soils**

*Composition:* 65 percent

*Geomorphic description:* Drainageway

*Slope:* 0 to 4 percent

*Elevation:* 5,560 to 6,250 feet

*Effective annual precipitation:* 16 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Very poorly drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* Occasional

*Water table:* Present

*Available water capacity:* Mainly 4.1 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

A—2 to 12 inches; loam

Bg—12 to 18 inches; sandy loam

BCg—18 to 26 inches; very gravelly loamy sand

2Cg—26 to 60 inches; very cobbly loamy coarse sand

**Bridger and similar soils**

*Composition:* 20 percent

*Geomorphic description:*

- Alluvial fan
- Footslope on hill
- Toeslope on hill

*Slope:* 2 to 8 percent

*Elevation:* 5,560 to 6,250 feet

*Effective annual precipitation:* 16 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 7.9 inches

*Typical profile:*

A1—0 to 3 inches; loam

A2—3 to 9 inches; loam

Bt—9 to 17 inches; clay

Bk—17 to 34 inches; loam

C—34 to 60 inches; sandy loam

**Kilgore and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Drainageway

*Slope:* 1 to 4 percent

*Elevation:* 5,560 to 6,250 feet

*Effective annual precipitation:* 16 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Silt loam

*Depth to restrictive feature:* None noted

*Drainage class:* Poorly drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* Rare

*Water table:* Present

*Available water capacity:* Mainly 6.4 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

A—2 to 19 inches; silt loam

Ag—19 to 29 inches; loam

2Cg—29 to 38 inches; gravelly sandy loam

2C—38 to 60 inches; very gravelly coarse sand

## 27D—Savenac-Bridger complex, 4 to 15 percent slopes

### Map Unit Setting

*Interpretive focus:* Rangeland

*Elevation:* 5,640 to 6,890 feet

*Mean annual precipitation:* 16 to 19 inches

*Frost-free period:* 30 to 50 days

### Component Description

#### **Savenac and similar soils**

*Composition:* 45 percent

*Geomorphic description:*

- Alluvial fan
- Drainageway

*Slope:* 4 to 8 percent

*Elevation:* 5,640 to 6,890 feet

*Effective annual precipitation:* 16 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Ashy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Moderately well drained

*Parent material:* Tertiary volcanic alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Water table:* Present

*Available water capacity:* Mainly 8.0 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

E—2 to 12 inches; ashy loam

E/Bt—12 to 28 inches; sandy clay loam

Bt—28 to 37 inches; clay loam

BC—37 to 60 inches; gravelly sandy loam

#### **Bridger and similar soils**

*Composition:* 35 percent

*Geomorphic description:*

- Footslope on hill
- Toeslope on hill

*Slope:* 4 to 15 percent

*Elevation:* 5,640 to 6,890 feet

*Effective annual precipitation:* 16 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Tertiary volcanic alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 7.9 inches

*Typical profile:*

A1—0 to 3 inches; loam

A2—3 to 9 inches; loam

Bt—9 to 17 inches; clay

Bk—17 to 34 inches; loam  
C—34 to 60 inches; sandy loam

### **Additional Components**

Mawspring and similar soils: 10 percent  
Mooseflat and similar soils: 10 percent

## **28C—Kilgore-Danielvil complex, 2 to 8 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,590 to 6,840 feet  
*Mean annual precipitation:* 15 to 24 inches  
*Frost-free period:* 30 to 50 days

### **Component Description**

#### **Kilgore and similar soils**

*Composition:* 55 percent  
*Geomorphic description:* Drainageway  
*Slope:* 2 to 4 percent  
*Elevation:* 5,590 to 6,840 feet  
*Effective annual precipitation:* 15 to 24 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Silty clay loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Poorly drained  
*Parent material:* Alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Water table:* Present  
*Available water capacity:* Mainly 6.4 inches  
*Typical profile:*  
    Oi—0 to 2 inches; slightly decomposed plant material  
    A—2 to 19 inches; silty clay loam  
    Ag—19 to 29 inches; loam  
    2Cg—29 to 38 inches; gravelly sandy loam  
    2C—38 to 60 inches; very gravelly coarse sand

#### **Danielvil, wet and similar soils**

*Composition:* 30 percent  
*Geomorphic description:* Stream terrace  
*Slope:* 2 to 8 percent  
*Elevation:* 5,590 to 6,840 feet  
*Effective annual precipitation:* 15 to 24 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Moderately well drained  
*Parent material:* Alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Water table:* Present  
*Available water capacity:* Mainly 6.9 inches

*Typical profile:*

- A1—0 to 5 inches; loam
- A2—5 to 13 inches; loam
- Bw—13 to 23 inches; gravelly sandy loam
- BC—23 to 34 inches; gravelly sandy loam
- 2C—34 to 60 inches; gravelly coarse sandy loam

**Additional Components**

- Bavdark and similar soils: 10 percent
- Beeftrail and similar soils: 5 percent

**31A—Philipsburg cobbly loam, 0 to 4 percent slopes,  
very stony**

**Map Unit Setting**

- Interpretive focus:* Rangeland
- Elevation:* 5,640 to 5,810 feet
- Mean annual precipitation:* 14 to 16 inches
- Frost-free period:* 50 to 70 days

**Component Description**

**Philipsburg, very stony and similar soils**

- Composition:* 90 percent
- Geomorphic description:* Tread on stream terrace
- Slope:* 0 to 4 percent
- Elevation:* 5,640 to 5,810 feet
- Effective annual precipitation:* 14 to 16 inches
- Frost-free period:* 50 to 70 days
- Surface layer texture:* Cobbly loam
- Rock fragments on the soil surface:* 0.10 to 2.00 percent stones, 7 to 30 feet apart
- Depth to restrictive feature:* None noted
- Drainage class:* Well drained
- Parent material:* Alluvium
- Native plant cover type:* Rangeland
- Flooding:* None
- Available water capacity:* Mainly 9.2 inches
- Typical profile:*
  - A—0 to 9 inches; cobbly loam
  - Bt—9 to 22 inches; clay loam
  - Bk1—22 to 40 inches; gravelly loam
  - Bk2—40 to 60 inches; gravelly loam

**Additional Components**

- Philipsburg, very stony and similar soils: 10 percent

**32B—Kilgore, occasionally flooded-Danielvil complex,  
1 to 4 percent slopes**

**Map Unit Setting**

- Interpretive focus:* Riparian
- Elevation:* 5,280 to 5,720 feet

*Mean annual precipitation:* 12 to 16 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Kilgore and similar soils**

*Composition:* 65 percent

*Geomorphic description:* Flood plain

*Slope:* 1 to 4 percent

*Elevation:* 5,280 to 5,720 feet

*Effective annual precipitation:* 12 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Poorly drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* Occasional

*Water table:* Present

*Available water capacity:* Mainly 6.4 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

A—2 to 19 inches; sandy loam

Ag—19 to 29 inches; loam

2Cg—29 to 38 inches; gravelly sandy loam

2C—38 to 60 inches; very gravelly coarse sand

#### **Danielvil, wet and similar soils**

*Composition:* 25 percent

*Geomorphic description:* Tread on stream terrace

*Slope:* 1 to 4 percent

*Elevation:* 5,280 to 5,720 feet

*Effective annual precipitation:* 12 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Moderately well drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Water table:* Present

*Available water capacity:* Mainly 6.9 inches

*Typical profile:*

A1—0 to 5 inches; loam

A2—5 to 13 inches; loam

Bw—13 to 23 inches; gravelly sandy loam

BC—23 to 34 inches; gravelly sandy loam

2C—34 to 60 inches; gravelly coarse sandy loam

### **Additional Components**

Philipsburg and similar soils: 10 percent

### **33B—Sebud very cobbly loam, 2 to 6 percent slopes, very stony**

#### **Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,680 to 6,120 feet  
*Mean annual precipitation:* 12 to 16 inches  
*Frost-free period:* 50 to 70 days

#### **Component Description**

##### **Sebud, very stony and similar soils**

*Composition:* 90 percent  
*Geomorphic description:* Fan remnant  
*Slope:* 2 to 6 percent  
*Elevation:* 5,680 to 6,120 feet  
*Effective annual precipitation:* 12 to 16 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Very cobbly loam  
*Rock fragments on the soil surface:* 0.10 to 2.50 percent stones, 7 to 23 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Cobbly alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 3.8 inches  
*Typical profile:*  
    A1—0 to 6 inches; very cobbly loam  
    A2—6 to 12 inches; very cobbly loam  
    Bw—12 to 20 inches; very cobbly sandy loam  
    BC—20 to 30 inches; very cobbly sandy loam  
    C—30 to 60 inches; very gravelly sandy loam

#### **Additional Components**

Danielvil and similar soils: 10 percent

### **34A—Danielvil-Danielvil, rarely flooded complex, 0 to 4 percent slopes**

#### **Map Unit Setting**

*Interpretive focus:* Forestland  
*Field investigation intensity:* Order 2  
*Elevation:* 5,690 to 6,310 feet  
*Mean annual precipitation:* 15 to 19 inches  
*Frost-free period:* 30 to 50 days

#### **Component Description**

##### **Danielvil and similar soils**

*Composition:* 80 percent  
*Geomorphic description:* Stream terrace  
*Slope:* 0 to 4 percent  
*Elevation:* 5,690 to 6,320 feet



*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 6.9 inches

*Typical profile:*

A1—0 to 5 inches; sandy loam

A2—5 to 13 inches; loam

Bw—13 to 23 inches; gravelly sandy loam

BC—23 to 34 inches; gravelly sandy loam

2C—34 to 60 inches; gravelly coarse sandy loam

#### **Danielvil, wet and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Drainageway

*Slope:* 0 to 4 percent

*Elevation:* 5,690 to 6,320 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Moderately well drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* Rare

*Water table:* Present

*Available water capacity:* Mainly 6.9 inches

*Typical profile:*

A1—0 to 5 inches; loam

A2—5 to 13 inches; loam

Bw—13 to 23 inches; gravelly sandy loam

BC—23 to 34 inches; gravelly sandy loam

2C—34 to 60 inches; gravelly coarse sandy loam

### **36A—Foolhen-Monaberg-Mooseflat complex, 0 to 4 percent slopes**

#### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,540 to 5,870 feet

*Mean annual precipitation:* 12 to 16 inches

*Frost-free period:* 50 to 70 days

#### **Component Description**

##### **Foolhen and similar soils**

*Composition:* 40 percent

*Geomorphic description:* Stream terrace

*Slope:* 0 to 2 percent

*Elevation:* 5,540 to 5,870 feet

*Effective annual precipitation:* 12 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Somewhat poorly drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Water table:* Present

*Available water capacity:* Mainly 9.5 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

A—2 to 13 inches; loam

Bw—13 to 26 inches; loam

C1—26 to 39 inches; sandy clay loam

C2—39 to 60 inches; sandy clay loam

### **Monaberg, wet and similar soils**

*Composition:* 40 percent

*Geomorphic description:* Stream terrace

*Slope:* 0 to 4 percent

*Elevation:* 5,540 to 5,870 feet

*Effective annual precipitation:* 12 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Moderately well drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Water table:* Present

*Available water capacity:* Mainly 8.3 inches

*Typical profile:*

A—0 to 10 inches; loam

Bt—10 to 28 inches; gravelly sandy clay loam

C—28 to 60 inches; gravelly sandy clay loam

### **Mooseflat and similar soils**

*Composition:* 15 percent

*Geomorphic description:*

- Stream terrace
- Swale

*Slope:* 0 to 2 percent

*Elevation:* 5,540 to 5,870 feet

*Effective annual precipitation:* 12 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Silt loam

*Depth to restrictive feature:* None noted

*Drainage class:* Very poorly drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Water table:* Present

*Available water capacity:* Mainly 4.1 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material  
A—2 to 12 inches; silt loam  
Bg—12 to 18 inches; sandy loam  
BCg—18 to 26 inches; very gravelly loamy sand  
2Cg—26 to 60 inches; very cobbly loamy coarse sand

**Additional Components**

Bearmouth and similar soils: 5 percent

**37B—Mooseflat, occasionally flooded-Monaberg, rarely flooded complex, 1 to 4 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Riparian

*Elevation:* 5,690 to 6,120 feet

*Mean annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

**Component Description**

**Mooseflat and similar soils**

*Composition:* 80 percent

*Geomorphic description:* Flood plain

*Slope:* 1 to 4 percent

*Elevation:* 5,690 to 6,120 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Very poorly drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* Occasional

*Water table:* Present

*Available water capacity:* Mainly 4.1 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material  
A—2 to 12 inches; loam  
Bg—12 to 18 inches; sandy loam  
BCg—18 to 26 inches; very gravelly loamy sand  
2Cg—26 to 60 inches; very cobbly loamy coarse sand

**Monaberg, wet and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Flood-plain step

*Slope:* 1 to 4 percent

*Elevation:* 5,690 to 6,120 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Moderately well drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* Rare

*Water table:* Present

*Available water capacity:* Mainly 8.3 inches

*Typical profile:*

A—0 to 10 inches; loam

Bt—10 to 28 inches; gravelly sandy clay loam

C—28 to 60 inches; gravelly sandy clay loam

## **38B—Rivra gravelly sandy loam, 0 to 4 percent slopes, moderately impacted**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,050 to 5,680 feet

*Mean annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Rivra, moderately impacted and similar soils**

*Composition:* 85 percent

*Geomorphic description:*

- Alluvial fan
- Stream terrace

*Slope:* 0 to 4 percent

*Elevation:* 5,050 to 5,680 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Gravelly sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Excessively drained

*Parent material:* Sandy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.1 inches

*Typical profile:*

A1—0 to 0 inches; gravelly sandy loam

A2—0 to 8 inches; gravelly sandy loam

C1—8 to 43 inches; gravelly loamy coarse sand

C2—43 to 60 inches; gravelly coarse sand

### **Additional Components**

Riverwash: 10 percent

Riverrun, moderately impacted and similar soils: 5 percent

## **40B—Cetrack loam, 0 to 4 percent slopes, moderately impacted**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 4,920 to 5,510 feet

*Mean annual precipitation:* 10 to 14 inches

*Frost-free period:* 70 to 105 days

### **Component Description**

#### **Cetrack, moderately impacted and similar soils**

*Composition:* 85 percent

*Geomorphic description:*

- Alluvial fan
- Outwash plain
- Stream terrace

*Slope:* 0 to 4 percent

*Elevation:* 4,920 to 5,510 feet

*Effective annual precipitation:* 10 to 14 inches

*Frost-free period:* 70 to 105 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Fine-loamy alluvium over sandy and gravelly alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.8 inches

*Typical profile:*

A1—0 to 0 inches; loam

A2—0 to 6 inches; loam

Bw—6 to 11 inches; loam

Bk—11 to 30 inches; loam

2C—30 to 60 inches; very gravelly loamy sand

### **Additional Components**

Con, moderately impacted and similar soils: 5 percent

Saypo, moderately impacted and similar soils: 5 percent

Sixbeacon, moderately impacted and similar soils: 5 percent

## **42D—Varney-Varney, stony-Anamac, stony complex, 2 to 12 percent slopes, moderately impacted**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,070 to 5,410 feet

*Mean annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Varney, moderately impacted and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Tread on stream terrace

*Slope:* 2 to 8 percent

*Elevation:* 5,070 to 5,410 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 6.8 inches

*Typical profile:*

A1—0 to 0 inches; sandy loam

A2—0 to 7 inches; sandy loam

Bt—7 to 18 inches; gravelly sandy clay loam

Bk—18 to 48 inches; gravelly sandy loam

C—48 to 60 inches; gravelly loamy coarse sand

**Varney, moderately impacted, stony and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Riser on stream terrace

*Slope:* 6 to 12 percent

*Elevation:* 5,070 to 5,410 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Gravelly loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 6.8 inches

*Typical profile:*

A1—0 to 0 inches; gravelly loam

A2—0 to 7 inches; gravelly loam

Bt—7 to 18 inches; gravelly sandy clay loam

Bk—18 to 48 inches; gravelly sandy loam

C—48 to 60 inches; gravelly loamy coarse sand

**Anamac, moderately impacted, stony and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Tread on stream terrace

*Slope:* 4 to 12 percent

*Elevation:* 5,070 to 5,410 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Sandy loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 7.0 inches

*Typical profile:*

A1—0 to 0 inches; sandy loam

A2—0 to 8 inches; sandy loam

Bw—8 to 15 inches; loam

Bk1—15 to 28 inches; loam

Bk2—28 to 38 inches; gravelly loam

C—38 to 60 inches; very gravelly sandy loam

### **Additional Components**

Sixbeacon, moderately impacted, stony and similar soils: 10 percent  
Rivra, moderately impacted and similar soils: 5 percent

## **43B—Meadowcreek-Mannixlee, rarely flooded complex, 0 to 4 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,100 to 5,510 feet  
*Mean annual precipitation:* 12 to 14 inches  
*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Meadowcreek and similar soils**

*Composition:* 60 percent  
*Geomorphic description:* Tread on stream terrace  
*Slope:* 0 to 4 percent  
*Elevation:* 5,100 to 5,510 feet  
*Effective annual precipitation:* 12 to 14 inches  
*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Silty clay loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Somewhat poorly drained  
*Parent material:* Clayey alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Water table:* Present  
*Available water capacity:* Mainly 6.8 inches  
*Typical profile:*  
    A—0 to 11 inches; silty clay loam  
    Bg—11 to 32 inches; silt loam  
    2C—32 to 60 inches; very gravelly sand

#### **Mannixlee and similar soils**

*Composition:* 30 percent  
*Geomorphic description:* Flood plain  
*Slope:* 0 to 2 percent  
*Elevation:* 5,100 to 5,510 feet  
*Effective annual precipitation:* 12 to 14 inches  
*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Silt loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Poorly drained  
*Parent material:* Loamy alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* Rare  
*Water table:* Present  
*Available water capacity:* Mainly 6.2 inches  
*Typical profile:*  
    Oi—0 to 2 inches; slightly decomposed plant material  
    A—2 to 19 inches; silt loam

Bw—19 to 28 inches; loam  
2Cg—28 to 60 inches; gravelly coarse sand

#### **Additional Components**

Patouza, very deep and similar soils: 7 percent  
Sixbeacon and similar soils: 3 percent

### **44B—Meadowcreek-Anamac complex, 1 to 6 percent slopes, moderately impacted**

#### **Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,250 to 5,410 feet  
*Mean annual precipitation:* 12 to 14 inches  
*Frost-free period:* 70 to 90 days

#### **Component Description**

##### **Meadowcreek, moderately impacted and similar soils**

*Composition:* 70 percent  
*Geomorphic description:* Alluvial fan  
*Slope:* 1 to 4 percent  
*Elevation:* 5,250 to 5,410 feet  
*Effective annual precipitation:* 12 to 14 inches  
*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Silty clay loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Somewhat poorly drained  
*Parent material:* Loamy alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Water table:* Present  
*Available water capacity:* Mainly 6.8 inches  
*Typical profile:*  
    A1—0 to 0 inches; silty clay loam  
    A2—0 to 11 inches; silty clay loam  
    Bg—11 to 32 inches; silt loam  
    2C—32 to 60 inches; very gravelly sand

##### **Anamac, moderately impacted and similar soils**

*Composition:* 20 percent  
*Geomorphic description:* Alluvial fan  
*Slope:* 1 to 6 percent  
*Elevation:* 5,250 to 5,410 feet  
*Effective annual precipitation:* 12 to 14 inches  
*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Loamy alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 7.0 inches



*Typical profile:*

- A1—0 to 0 inches; loam
- A2—0 to 8 inches; loam
- Bw—8 to 15 inches; loam
- Bk1—15 to 28 inches; loam
- Bk2—28 to 38 inches; gravelly loam
- C—38 to 60 inches; very gravelly sandy loam

**Additional Components**

Bonebasin, moderately impacted and similar soils: 10 percent

**46A—Varney-Rivra complex, 0 to 4 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,300 to 5,410 feet

*Mean annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

**Component Description**

**Varney and similar soils**

*Composition:* 70 percent

*Geomorphic description:* Tread on stream terrace

*Slope:* 0 to 2 percent

*Elevation:* 5,300 to 5,410 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 6.8 inches

*Typical profile:*

- A—0 to 7 inches; loam
- Bt—7 to 18 inches; gravelly sandy clay loam
- Bk—18 to 48 inches; gravelly sandy loam
- C—48 to 60 inches; gravelly loamy coarse sand

**Rivra and similar soils**

*Composition:* 20 percent

*Geomorphic description:*

- Tread on stream terrace
- Swale

*Slope:* 1 to 4 percent

*Elevation:* 5,300 to 5,410 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.1 inches

*Typical profile:*

A—0 to 8 inches; loam

C1—8 to 43 inches; gravelly loamy coarse sand

C2—43 to 60 inches; gravelly coarse sand

#### **Additional Components**

Varney and similar soils: 10 percent

### **47B—Foolhen-Monaberg-Kilgore, occasionally flooded complex, 0 to 6 percent slopes**

#### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 6,640 to 6,710 feet

*Mean annual precipitation:* 20 to 24 inches

*Frost-free period:* 30 to 50 days

#### **Component Description**

##### **Foolhen and similar soils**

*Composition:* 65 percent

*Geomorphic description:* Wet basin floor

*Slope:* 1 to 4 percent

*Elevation:* 6,640 to 6,710 feet

*Effective annual precipitation:* 20 to 24 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Mucky silt loam

*Depth to restrictive feature:* None noted

*Drainage class:* Somewhat poorly drained

*Parent material:* Mixed volcanic or granite alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Water table:* Present

*Available water capacity:* Mainly 9.5 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

A—2 to 13 inches; mucky silt loam

Bw—13 to 26 inches; loam

C1—26 to 39 inches; sandy clay loam

C2—39 to 60 inches; sandy clay loam

##### **Monaberg, wet and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Upper edges of wet basin floor

*Slope:* 2 to 6 percent

*Elevation:* 6,640 to 6,710 feet

*Effective annual precipitation:* 20 to 24 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Moderately well drained

*Parent material:* Mixed volcanic or granite alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Water table:* Present

*Available water capacity:* Mainly 8.3 inches

*Typical profile:*

A—0 to 10 inches; loam

Bt—10 to 28 inches; gravelly sandy clay loam

C—28 to 60 inches; gravelly sandy clay loam

#### **Kilgore and similar soils**

*Composition:* 15 percent

*Geomorphic description:*

- Wet basin floor
- Swale

*Slope:* 0 to 2 percent

*Elevation:* 6,640 to 6,710 feet

*Effective annual precipitation:* 20 to 24 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Silty clay loam

*Depth to restrictive feature:* None noted

*Drainage class:* Poorly drained

*Parent material:* Mixed volcanic or granite alluvium

*Native plant cover type:* Rangeland

*Flooding:* Occasional

*Water table:* Present

*Available water capacity:* Mainly 6.4 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

A—2 to 19 inches; silty clay loam

Ag—19 to 29 inches; loam

2Cg—29 to 38 inches; gravelly sandy loam

2C—38 to 60 inches; very gravelly coarse sand

### **50A—Bonebasin, occasionally flooded-Meadowcreek, rarely flooded complex, 0 to 4 percent slopes, moderately impacted**

#### **Map Unit Setting**

*Interpretive focus:* Riparian

*Elevation:* 5,080 to 6,890 feet

*Mean annual precipitation:* 10 to 14 inches

*Frost-free period:* 70 to 90 days

#### **Component Description**

##### **Bonebasin, moderately impacted and similar soils**

*Composition:* 65 percent

*Geomorphic description:* Flood plain

*Slope:* 0 to 2 percent

*Elevation:* 5,090 to 6,890 feet

*Effective annual precipitation:* 10 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Very poorly drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* Occasional

*Water table:* Present

*Available water capacity:* Mainly 4.8 inches

*Typical profile:*

A1—0 to 0 inches; sandy loam

A2—0 to 10 inches; sandy loam

Cg—10 to 24 inches; loam

2C—24 to 60 inches; very gravelly coarse sand

### **Meadowcreek, moderately impacted and similar soils**

*Composition:* 25 percent

*Geomorphic description:* Flood plain

*Slope:* 0 to 4 percent

*Elevation:* 5,090 to 6,890 feet

*Effective annual precipitation:* 10 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Silt loam

*Depth to restrictive feature:* None noted

*Drainage class:* Somewhat poorly drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* Rare

*Water table:* Present

*Available water capacity:* Mainly 6.8 inches

*Typical profile:*

A1—0 to 0 inches; silt loam

A2—0 to 11 inches; silt loam

Bg—11 to 32 inches; silt loam

2C—32 to 60 inches; very gravelly sand

### **Additional Components**

Slickens: 10 percent

## **51D—Foxgulch-Libeg complex, 6 to 25 percent slopes, stony**

### **Map Unit Setting**

*Interpretive focus:* Riparian

*Elevation:* 5,430 to 6,560 feet

*Mean annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Foxgulch, stony and similar soils**

*Composition:* 65 percent

*Geomorphic description:* Toeslope on hill

*Slope:* 6 to 12 percent

*Elevation:* 5,430 to 6,560 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Somewhat poorly drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Water table:* Present

*Available water capacity:* Mainly 7.8 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

A—1 to 12 inches; loam

Bw—12 to 30 inches; loam

BC—30 to 46 inches; sandy clay loam

2C—46 to 60 inches; very gravelly coarse sand

### **Libeg, stony and similar soils**

*Composition:* 25 percent

*Geomorphic description:*

- Backslope on hill
- Footslope on hill

*Slope:* 8 to 25 percent

*Elevation:* 5,430 to 6,560 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Slope alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 4.9 inches

*Typical profile:*

A1—0 to 5 inches; gravelly loam

A2—5 to 11 inches; very cobbly loam

Bt—11 to 23 inches; very gravelly sandy clay loam

C—23 to 60 inches; very gravelly sandy loam

### **Additional Components**

Mooseflat and similar soils: 10 percent

## **53C—Sixbeacon-Sieben complex, 2 to 8 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,380 to 5,610 feet

*Mean annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

### Component Description

#### **Sixbeacon and similar soils**

*Composition:* 60 percent

*Geomorphic description:* Alluvial fan

*Slope:* 2 to 8 percent

*Elevation:* 5,380 to 5,610 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Cobbly loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 4.9 inches

*Typical profile:*

A—0 to 6 inches; cobbly loam

Bw—6 to 12 inches; very cobbly loam

Bk1—12 to 35 inches; very gravelly loam

Bk2—35 to 60 inches; very gravelly sandy loam

#### **Sieben and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Alluvial fan

*Slope:* 4 to 8 percent

*Elevation:* 5,380 to 5,610 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Very cobbly loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 4.2 inches

*Typical profile:*

A—0 to 5 inches; very cobbly loam

Bt—5 to 12 inches; very gravelly sandy clay loam

Bk1—12 to 25 inches; very gravelly sandy loam

Bk2—25 to 60 inches; very gravelly sandy loam

### Additional Components

Sieben and similar soils: 7 percent

Rivra and similar soils: 3 percent

### **55A—Bonebasin, occasionally flooded-Monaberg, very rarely flooded-Meadowcreek, rarely flooded complex, 0 to 4 percent slopes**

### Map Unit Setting

*Interpretive focus:* Riparian

*Elevation:* 5,360 to 5,740 feet

*Mean annual precipitation:* 12 to 16 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Bonebasin and similar soils**

*Composition:* 55 percent

*Geomorphic description:* Flood plain

*Slope:* 0 to 2 percent

*Elevation:* 5,360 to 5,740 feet

*Effective annual precipitation:* 12 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Silt loam

*Depth to restrictive feature:* None noted

*Drainage class:* Very poorly drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* Occasional

*Water table:* Present

*Available water capacity:* Mainly 4.8 inches

*Typical profile:*

A—0 to 10 inches; silt loam

Cg—10 to 24 inches; loam

2C—24 to 60 inches; very gravelly coarse sand

#### **Monaberg, wet and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Flood plain

*Slope:* 1 to 4 percent

*Elevation:* 5,360 to 5,740 feet

*Effective annual precipitation:* 12 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Moderately well drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* Very rare

*Water table:* Present

*Available water capacity:* Mainly 8.3 inches

*Typical profile:*

A—0 to 10 inches; loam

Bt—10 to 28 inches; gravelly sandy clay loam

C—28 to 60 inches; gravelly sandy clay loam

#### **Meadowcreek and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Toeslope on hill

*Slope:* 1 to 4 percent

*Elevation:* 5,360 to 5,740 feet

*Effective annual precipitation:* 12 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Silty clay loam

*Depth to restrictive feature:* None noted

*Drainage class:* Somewhat poorly drained

*Parent material:* Alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* Rare  
*Water table:* Present  
*Available water capacity:* Mainly 6.8 inches  
*Typical profile:*  
    A—0 to 11 inches; silty clay loam  
    Bg—11 to 32 inches; silt loam  
    2C—32 to 60 inches; very gravelly sand

## **56B—Bonebasin, occasionally flooded-Meadowcreek, rarely flooded complex, 0 to 4 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Riparian  
*Elevation:* 5,220 to 5,690 feet  
*Mean annual precipitation:* 11 to 14 inches  
*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Bonebasin and similar soils**

*Composition:* 50 percent  
*Geomorphic description:* Flood plain  
*Slope:* 0 to 2 percent  
*Elevation:* 5,220 to 5,690 feet  
*Effective annual precipitation:* 11 to 14 inches  
*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Very poorly drained  
*Parent material:* Alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* Occasional  
*Water table:* Present  
*Available water capacity:* Mainly 4.8 inches  
*Typical profile:*  
    A—0 to 10 inches; loam  
    Cg—10 to 24 inches; loam  
    2C—24 to 60 inches; very gravelly coarse sand

#### **Meadowcreek and similar soils**

*Composition:* 40 percent  
*Geomorphic description:* Flood plain  
*Slope:* 1 to 4 percent  
*Elevation:* 5,220 to 5,690 feet  
*Effective annual precipitation:* 11 to 14 inches  
*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Silt loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Somewhat poorly drained  
*Parent material:* Alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* Rare



*Water table:* Present

*Available water capacity:* Mainly 6.8 inches

*Typical profile:*

A—0 to 11 inches; silt loam

Bg—11 to 32 inches; silt loam

2C—32 to 60 inches; very gravelly sand

### **Additional Components**

Mannixlee and similar soils: 10 percent

## **58B—Varney-Anaconda loams, 0 to 4 percent slopes, moderately impacted**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,230 to 6,050 feet

*Mean annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 100 days

### **Component Description**

#### **Varney, moderately impacted and similar soils**

*Composition:* 60 percent

*Geomorphic description:*

- Alluvial fan
- Stream terrace

*Slope:* 0 to 4 percent

*Elevation:* 5,230 to 6,050 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 100 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Fine-loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Salt affected:* Saline within 30 inches

*Available water capacity:* Mainly 7.6 inches

*Typical profile:*

A1—0 to 0 inches; loam

A2—0 to 7 inches; loam

Bt—7 to 12 inches; gravelly clay loam

Bk—12 to 60 inches; gravelly sandy loam

#### **Anaconda, moderately impacted and similar soils**

*Composition:* 30 percent

*Geomorphic description:*

- Alluvial fan
- Stream terrace

*Slope:* 0 to 4 percent

*Elevation:* 5,230 to 6,050 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 100 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Fine-loamy alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Salt affected:* Saline within 30 inches  
*Available water capacity:* Mainly 7.4 inches  
*Typical profile:*  
A1—0 to 0 inches; loam  
A2—0 to 8 inches; loam  
Bw—8 to 14 inches; sandy loam  
Bk1—14 to 27 inches; sandy loam  
Bk2—27 to 60 inches; sandy loam

#### **Additional Components**

Varney, cobbly, moderately impacted and similar soils: 10 percent

### **59A—Anamac-Meadowcreek complex, 0 to 2 percent slopes**

#### **Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,180 to 5,280 feet  
*Mean annual precipitation:* 10 to 12 inches  
*Frost-free period:* 70 to 90 days

#### **Component Description**

##### **Anamac and similar soils**

*Composition:* 70 percent  
*Geomorphic description:* Alluvial fan  
*Slope:* 0 to 2 percent  
*Elevation:* 5,180 to 5,280 feet  
*Effective annual precipitation:* 10 to 12 inches  
*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Clay loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Loamy alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 7.0 inches  
*Typical profile:*  
A—0 to 8 inches; clay loam  
Bw—8 to 15 inches; loam  
Bk1—15 to 28 inches; loam  
Bk2—28 to 38 inches; gravelly loam  
C—38 to 60 inches; very gravelly sandy loam

##### **Meadowcreek and similar soils**

*Composition:* 20 percent  
*Geomorphic description:* Slight depressions on alluvial fan  
*Slope:* 0 to 2 percent  
*Elevation:* 5,180 to 5,280 feet

*Effective annual precipitation:* 10 to 12 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Clay loam

*Depth to restrictive feature:* None noted

*Drainage class:* Somewhat poorly drained

*Parent material:* Loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Water table:* Present

*Available water capacity:* Mainly 6.8 inches

*Typical profile:*

A—0 to 11 inches; clay loam

Bg—11 to 32 inches; silt loam

2C—32 to 60 inches; very gravelly sand

### **Additional Components**

Sixbeacon and similar soils: 10 percent

## **60A—Riverrun-Rivra complex, 0 to 2 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Riparian

*Elevation:* 5,170 to 5,300 feet

*Mean annual precipitation:* 10 to 12 inches

*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Riverrun and similar soils**

*Composition:* 50 percent

*Geomorphic description:* Flood plain

*Slope:* 0 to 1 percent

*Elevation:* 5,170 to 5,300 feet

*Effective annual precipitation:* 10 to 12 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Fine sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Somewhat poorly drained

*Parent material:* Sandy alluvium

*Native plant cover type:* Rangeland

*Flooding:* Occasional

*Water table:* Present

*Available water capacity:* Mainly 3.6 inches

*Typical profile:*

A—0 to 5 inches; fine sandy loam

C1—5 to 21 inches; gravelly coarse sandy loam

C2—21 to 60 inches; very gravelly sand

#### **Rivra and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Stream terrace

*Slope:* 0 to 2 percent

*Elevation:* 5,170 to 5,300 feet

*Effective annual precipitation:* 10 to 12 inches

*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Gravelly sandy loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Sandy alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 3.1 inches  
*Typical profile:*

A—0 to 8 inches; gravelly sandy loam  
C1—8 to 43 inches; gravelly loamy coarse sand  
C2—43 to 60 inches; gravelly coarse sand

### **Additional Components**

Meadowcreek and similar soils: 8 percent  
Work, stony and similar soils: 4 percent  
Bonebasin and similar soils: 3 percent

## **61A—Rivra, stony-Riverrun complex, 0 to 2 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,180 to 5,400 feet  
*Mean annual precipitation:* 10 to 12 inches  
*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Rivra, stony and similar soils**

*Composition:* 50 percent  
*Geomorphic description:* Stream terrace  
*Slope:* 0 to 2 percent  
*Elevation:* 5,180 to 5,400 feet  
*Effective annual precipitation:* 10 to 12 inches  
*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Very cobbly sandy loam  
*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Excessively drained  
*Parent material:* Sandy alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 3.1 inches  
*Typical profile:*  
A—0 to 8 inches; very cobbly sandy loam  
C1—8 to 43 inches; gravelly loamy coarse sand  
C2—43 to 60 inches; gravelly coarse sand

#### **Riverrun and similar soils**

*Composition:* 35 percent  
*Geomorphic description:* Stream terrace  
*Slope:* 0 to 1 percent  
*Elevation:* 5,180 to 5,400 feet

*Effective annual precipitation:* 10 to 12 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Fine sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Somewhat poorly drained

*Parent material:* Sandy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Water table:* Present

*Available water capacity:* Mainly 3.6 inches

*Typical profile:*

A—0 to 5 inches; fine sandy loam

C1—5 to 21 inches; gravelly coarse sandy loam

C2—21 to 60 inches; very gravelly sand

### **Additional Components**

Meadowcreek, stony and similar soils: 8 percent

Vendome, very stony and similar soils: 5 percent

Anamac and similar soils: 2 percent

## **62A—Vendome-Sieben complex, 0 to 2 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,180 to 5,490 feet

*Mean annual precipitation:* 10 to 14 inches

*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Vendome and similar soils**

*Composition:* 65 percent

*Geomorphic description:* Stream terrace

*Slope:* 0 to 2 percent

*Elevation:* 5,180 to 5,500 feet

*Effective annual precipitation:* 10 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Very cobbly loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Sandy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.9 inches

*Typical profile:*

A—0 to 11 inches; very cobbly loam

Bk1—11 to 24 inches; very cobbly sandy loam

2Bk2—24 to 60 inches; very cobbly coarse sand

#### **Sieben and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Stream terrace

*Slope:* 0 to 2 percent

*Elevation:* 5,180 to 5,500 feet

*Effective annual precipitation:* 10 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Cobbly loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 4.2 inches

*Typical profile:*

A—0 to 5 inches; cobbly loam

Bt—5 to 12 inches; very gravelly sandy clay loam

Bk1—12 to 25 inches; very gravelly sandy loam

Bk2—25 to 60 inches; very gravelly sandy loam

#### **Additional Components**

Rivra and similar soils: 10 percent

Riverrun and similar soils: 5 percent

### **64A—Work clay loam, 0 to 4 percent slopes**

#### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,360 to 5,410 feet

*Mean annual precipitation:* 10 to 12 inches

*Frost-free period:* 70 to 90 days

#### **Component Description**

##### **Work, wet and similar soils**

*Composition:* 90 percent

*Geomorphic description:* Stream terrace

*Slope:* 0 to 4 percent

*Elevation:* 5,360 to 5,410 feet

*Effective annual precipitation:* 10 to 12 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Clay loam

*Depth to restrictive feature:* None noted

*Drainage class:* Moderately well drained

*Parent material:* Clayey alluvium over sand and gravel

*Native plant cover type:* Rangeland

*Flooding:* None

*Water table:* Present

*Available water capacity:* Mainly 7.5 inches

*Typical profile:*

A—0 to 7 inches; clay loam

Bt—7 to 16 inches; clay loam

Bk—16 to 25 inches; gravelly sandy clay loam

2C—25 to 60 inches; gravelly loamy sand

#### **Additional Components**

Meadowcreek, stony and similar soils: 10 percent

## **65B—Sebud-Bearmouth complex, 1 to 4 percent slopes, very stony**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,540 to 6,300 feet

*Mean annual precipitation:* 13 to 17 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Sebud, very stony and similar soils**

*Composition:* 50 percent

*Geomorphic description:* Alluvial fan

*Slope:* 1 to 2 percent

*Elevation:* 5,540 to 6,300 feet

*Effective annual precipitation:* 13 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly loam

*Rock fragments on the soil surface:* 0.20 to 3.00 percent stones, 10 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Sandy and gravelly alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.8 inches

*Typical profile:*

A1—0 to 6 inches; gravelly loam

A2—6 to 12 inches; very cobbly loam

Bw—12 to 20 inches; very cobbly sandy loam

BC—20 to 30 inches; very cobbly sandy loam

C—30 to 60 inches; very gravelly sandy loam

#### **Bearmouth, extremely stony and similar soils**

*Composition:* 40 percent

*Geomorphic description:* Gravel bars on alluvial fan

*Slope:* 1 to 4 percent

*Elevation:* 5,540 to 6,300 feet

*Effective annual precipitation:* 13 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly sandy loam

*Rock fragments on the soil surface:* 1 to 6 percent stones, 5 to 33 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Sandy and gravelly alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 2.2 inches

*Typical profile:*

A—0 to 6 inches; gravelly sandy loam

Bw—6 to 11 inches; gravelly coarse sandy loam

BC—11 to 18 inches; gravelly coarse sandy loam

2C1—18 to 34 inches; very cobbly loamy coarse sand

2C2—34 to 60 inches; very cobbly sand

### **Additional Components**

Foxgulch and similar soils: 8 percent

Bearmouth, extremely stony and similar soils: 2 percent

## **67A—Foxgulch-Bearmouth, very stony complex, 0 to 4 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,610 to 5,900 feet

*Mean annual precipitation:* 12 to 16 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Foxgulch and similar soils**

*Composition:* 75 percent

*Geomorphic description:*

- Alluvial fan
- Stream terrace

*Slope:* 0 to 2 percent

*Elevation:* 5,610 to 5,910 feet

*Effective annual precipitation:* 12 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Somewhat poorly drained

*Parent material:* Sandy and gravelly alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Water table:* Present

*Available water capacity:* Mainly 7.8 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

A—1 to 12 inches; loam

Bw—12 to 30 inches; loam

BC—30 to 46 inches; sandy clay loam

2C—46 to 60 inches; very gravelly coarse sand

#### **Bearmouth, very stony and similar soils**

*Composition:* 15 percent

*Geomorphic description:*

- Gravel bars on alluvial fan
- Gravel bars on stream terrace

*Slope:* 1 to 4 percent

*Elevation:* 5,610 to 5,910 feet

*Effective annual precipitation:* 12 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly sandy loam

*Rock fragments on the soil surface:* 0.05 to 2.00 percent stones, 17 to 70 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Sandy and gravelly alluvium



*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 2.2 inches

*Typical profile:*

A—0 to 6 inches; gravelly sandy loam

Bw—6 to 11 inches; gravelly coarse sandy loam

BC—11 to 18 inches; gravelly coarse sandy loam

2C1—18 to 34 inches; very cobbly loamy coarse sand

2C2—34 to 60 inches; very cobbly sand

### **Additional Components**

Bearmouth and similar soils: 10 percent

## **68B—Bearmouth, rarely flooded-Foxgulch, occasionally flooded complex, 0 to 4 percent slopes, very stony**

### **Map Unit Setting**

*Interpretive focus:* Riparian-woodland

*Elevation:* 5,560 to 6,090 feet

*Mean annual precipitation:* 12 to 16 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Bearmouth, very stony and similar soils**

*Composition:* 70 percent

*Geomorphic description:* Flood plain

*Slope:* 0 to 4 percent

*Elevation:* 5,560 to 6,090 feet

*Effective annual precipitation:* 12 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly sandy loam

*Rock fragments on the soil surface:* 0.10 to 2.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Sandy and gravelly alluvium

*Native plant cover type:* Rangeland

*Flooding:* Rare

*Available water capacity:* Mainly 2.2 inches

*Typical profile:*

A—0 to 6 inches; gravelly sandy loam

Bw—6 to 11 inches; gravelly coarse sandy loam

BC—11 to 18 inches; gravelly coarse sandy loam

2C1—18 to 34 inches; very cobbly loamy coarse sand

2C2—34 to 60 inches; very cobbly sand

#### **Foxgulch, very stony and similar soils**

*Composition:* 15 percent

*Geomorphic description:*

- Broad channel
- Flood plain

*Slope:* 0 to 2 percent

*Elevation:* 5,560 to 6,090 feet

*Effective annual precipitation:* 12 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Rock fragments on the soil surface:* 0.10 to 2.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Somewhat poorly drained

*Parent material:* Sandy and gravelly alluvium

*Native plant cover type:* Rangeland

*Flooding:* Occasional

*Water table:* Present

*Available water capacity:* Mainly 7.8 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

A—1 to 12 inches; loam

Bw—12 to 30 inches; loam

BC—30 to 46 inches; sandy clay loam

2C—46 to 60 inches; very gravelly coarse sand

### **Additional Components**

Kilgore and similar soils: 5 percent

Riverwash: 5 percent

Water: 4 percent

Bearmouth, very stony and similar soils: 1 percent

## **69B—Foxgulch loam, 1 to 4 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,640 to 5,940 feet

*Mean annual precipitation:* 12 to 16 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Foxgulch and similar soils**

*Composition:* 85 percent

*Geomorphic description:* Alluvial fan

*Slope:* 1 to 4 percent

*Elevation:* 5,640 to 5,940 feet

*Effective annual precipitation:* 12 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Somewhat poorly drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Water table:* Present

*Available water capacity:* Mainly 7.8 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

A—1 to 12 inches; loam

Bw—12 to 30 inches; loam

BC—30 to 46 inches; sandy clay loam

2C—46 to 60 inches; very gravelly coarse sand

### **Additional Components**

Mooseflat and similar soils: 10 percent  
Sebud and similar soils: 5 percent

## **71D—Sebud-Ratiopeak complex, 4 to 15 percent slopes, stony**

### **Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,450 to 6,300 feet  
*Mean annual precipitation:* 13 to 17 inches  
*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Sebud, stony and similar soils**

*Composition:* 75 percent  
*Geomorphic description:* Alluvial fan  
*Slope:* 4 to 8 percent  
*Elevation:* 5,450 to 6,300 feet  
*Effective annual precipitation:* 13 to 17 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Gravelly loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Sandy and gravelly alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 3.8 inches  
*Typical profile:*  
    A1—0 to 6 inches; gravelly loam  
    A2—6 to 12 inches; very cobbly loam  
    Bw—12 to 20 inches; very cobbly sandy loam  
    BC—20 to 30 inches; very cobbly sandy loam  
    C—30 to 60 inches; very gravelly sandy loam

#### **Ratiopeak, stony and similar soils**

*Composition:* 15 percent  
*Geomorphic description:* Footslope on hill  
*Slope:* 8 to 15 percent  
*Elevation:* 5,450 to 6,300 feet  
*Effective annual precipitation:* 13 to 17 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Very cobbly loam  
*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 150 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Alluvium derived from quartzite  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 6.3 inches

*Typical profile:*

- A—0 to 8 inches; very cobbly loam
- Bt—8 to 15 inches; very gravelly sandy clay loam
- Bk1—15 to 24 inches; very gravelly loam
- Bk2—24 to 45 inches; very cobbly loam
- BC—45 to 60 inches; very gravelly coarse sandy loam

**Additional Components**

Bearmouth, stony and similar soils: 9 percent  
Riverwash: 1 percent

**72B—Tibson gravelly loam, 1 to 4 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,450 to 5,860 feet  
*Mean annual precipitation:* 12 to 16 inches  
*Frost-free period:* 50 to 70 days

**Component Description**

**Tibson and similar soils**

*Composition:* 80 percent  
*Geomorphic description:* Alluvial fan  
*Slope:* 1 to 4 percent  
*Elevation:* 5,450 to 5,860 feet  
*Effective annual precipitation:* 12 to 16 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Gravelly loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Gravelly alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 5.3 inches  
*Typical profile:*

- A—0 to 6 inches; gravelly loam
- Bw—6 to 12 inches; cobbly loam
- Bk1—12 to 24 inches; very cobbly loam
- Bk2—24 to 60 inches; very cobbly loam

**Additional Components**

Tibson, stony and similar soils: 10 percent  
Tibson, loam and similar soils: 10 percent

**74A—Bearmouth very cobbly sandy loam, 0 to 2 percent slopes, very stony**

**Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,280 to 5,530 feet

*Mean annual precipitation:* 12 to 16 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Bearmouth, very stony and similar soils**

*Composition:* 80 percent

*Geomorphic description:* Stream terrace

*Slope:* 0 to 2 percent

*Elevation:* 5,280 to 5,530 feet

*Effective annual precipitation:* 12 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very cobbly sandy loam

*Rock fragments on the soil surface:* 0.10 to 2.00 percent stones, 17 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Sandy and gravelly alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 2.2 inches

*Typical profile:*

A—0 to 6 inches; very cobbly sandy loam

Bw—6 to 11 inches; gravelly coarse sandy loam

BC—11 to 18 inches; gravelly coarse sandy loam

2C1—18 to 34 inches; very cobbly loamy coarse sand

2C2—34 to 60 inches; very cobbly sand

### **Additional Components**

Bearmouth, very stony and similar soils: 10 percent

Sebud and similar soils: 10 percent

## **75A—Danielvil loam, 0 to 2 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,280 to 5,720 feet

*Mean annual precipitation:* 12 to 16 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Danielvil, wet and similar soils**

*Composition:* 85 percent

*Geomorphic description:* Stream terrace

*Slope:* 0 to 2 percent

*Elevation:* 5,280 to 5,720 feet

*Effective annual precipitation:* 12 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Moderately well drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Water table:* Present

*Available water capacity:* Mainly 6.9 inches

*Typical profile:*

A1—0 to 5 inches; loam

A2—5 to 13 inches; loam

Bw—13 to 23 inches; gravelly sandy loam

BC—23 to 34 inches; gravelly sandy loam

2C—34 to 60 inches; gravelly coarse sandy loam

#### **Additional Components**

Kilgore and similar soils: 10 percent

Bearmouth and similar soils: 5 percent

### **76A—Bearmouth very cobbly sandy loam, 0 to 4 percent slopes**

#### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,250 to 5,710 feet

*Mean annual precipitation:* 12 to 16 inches

*Frost-free period:* 50 to 70 days

#### **Component Description**

##### **Bearmouth and similar soils**

*Composition:* 90 percent

*Geomorphic description:* Tread on stream terrace

*Slope:* 0 to 4 percent

*Elevation:* 5,250 to 5,710 feet

*Effective annual precipitation:* 12 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very cobbly sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Sandy and gravelly alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 2.2 inches

*Typical profile:*

A—0 to 6 inches; very cobbly sandy loam

Bw—6 to 11 inches; gravelly coarse sandy loam

BC—11 to 18 inches; gravelly coarse sandy loam

2C1—18 to 34 inches; very cobbly loamy coarse sand

2C2—34 to 60 inches; very cobbly sand

#### **Additional Components**

Bearmouth, stony and similar soils: 8 percent

Bearmouth, very stony, steep and similar soils: 2 percent

## **80A—Water-Riverwash complex**

### **Map Unit Setting**

*Interpretive focus:* Riparian-woodland

*Elevation:* 5,250 to 5,810 feet

*Mean annual precipitation:* 12 to 16 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Water**

*Composition:* 80 percent

#### **Riverwash**

*Composition:* 15 percent

### **Additional Components**

Bearmouth, very stony and similar soils: 3 percent

Foolhen and similar soils: 2 percent

## **81A—Varney sandy loam, 0 to 4 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,530 to 5,640 feet

*Mean annual precipitation:* 10 to 12 inches

*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Varney and similar soils**

*Composition:* 85 percent

*Geomorphic description:* Tread on relic stream terrace

*Slope:* 0 to 4 percent

*Elevation:* 5,530 to 5,640 feet

*Effective annual precipitation:* 10 to 12 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Tertiary valley fill alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 6.8 inches

*Typical profile:*

A—0 to 7 inches; sandy loam

Bt—7 to 18 inches; gravelly sandy clay loam

Bk—18 to 48 inches; gravelly sandy loam

C—48 to 60 inches; gravelly loamy coarse sand

### **Additional Components**

Anamac and similar soils: 10 percent

Sieben and similar soils: 5 percent

## **82D—Philipsburg-Monaberg-Kilgore, occasionally flooded complex, 0 to 15 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Riparian

*Elevation:* 5,460 to 6,020 feet

*Mean annual precipitation:* 12 to 16 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Philipsburg, wet and similar soils**

*Composition:* 45 percent

*Geomorphic description:* Toeslope on hill

*Slope:* 2 to 8 percent

*Elevation:* 5,460 to 6,020 feet

*Effective annual precipitation:* 12 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Moderately well drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Water table:* Present

*Available water capacity:* Mainly 9.2 inches

*Typical profile:*

A—0 to 9 inches; loam

Bt—9 to 22 inches; clay loam

Bk—22 to 40 inches; gravelly loam

BC—40 to 44 inches; gravelly loam

C—44 to 60 inches; gravelly loam

#### **Monaberg and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Tread footslope on hill

*Slope:* 4 to 15 percent

*Elevation:* 5,460 to 6,020 feet

*Effective annual precipitation:* 12 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 8.3 inches

*Typical profile:*

A—0 to 10 inches; loam

Bt—10 to 28 inches; gravelly sandy clay loam

C—28 to 60 inches; gravelly sandy clay loam



**Kilgore and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Flood plain

*Slope:* 0 to 2 percent

*Elevation:* 5,460 to 6,020 feet

*Effective annual precipitation:* 12 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Silty clay loam

*Depth to restrictive feature:* None noted

*Drainage class:* Poorly drained

*Parent material:* Mixed volcanic or granite alluvium

*Native plant cover type:* Rangeland

*Flooding:* Occasional

*Water table:* Present

*Available water capacity:* Mainly 6.4 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

A—2 to 19 inches; silty clay loam

Ag—19 to 29 inches; loam

2Cg—29 to 38 inches; gravelly sandy loam

2C—38 to 60 inches; very gravelly coarse sand

**82E—Elve gravelly loam, 15 to 35 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Forestland

*Elevation:* 5,600 to 8,000 feet

*Mean annual precipitation:* 18 to 26 inches

*Frost-free period:* 30 to 70 days

**Component Description**

**Elve and similar soils**

*Composition:* 85 percent

*Geomorphic description:* Mountain slope

*Slope:* 15 to 35 percent

*Elevation:* 5,600 to 8,000 feet

*Effective annual precipitation:* 19 to 25 inches

*Frost-free period:* 30 to 70 days

*Surface layer texture:* Gravelly loam

*Depth to restrictive feature:* None noted

*Drainage class:* Somewhat excessively drained

*Parent material:* Gravelly colluvium

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 4.9 inches

*Typical profile:*

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 11 inches; gravelly loam

Bw—11 to 24 inches; extremely gravelly sandy loam

BC—24 to 60 inches; extremely gravelly loam

### **Additional Components**

Evapo and similar soils: 5 percent  
Rock outcrop: 5 percent  
Worock and similar soils: 5 percent

## **85E—Loberg gravelly loam, 15 to 35 percent slopes**

### **Map Unit Setting**

*Elevation:* 5,800 to 7,000 feet  
*Mean annual precipitation:* 15 to 30 inches  
*Frost-free period:* 30 to 70 days

### **Component Description**

#### **Loberg and similar soils**

*Composition:* 85 percent  
*Geomorphic description:*

- Mountainbase on mountain slope
- Mountainflank on mountain slope

*Slope:* 15 to 35 percent  
*Elevation:* 5,800 to 7,000 feet  
*Effective annual precipitation:* 15 to 30 inches  
*Frost-free period:* 30 to 70 days  
*Surface layer texture:* Gravelly loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Gravelly colluvium  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 4.7 inches  
*Typical profile:*

- Oi—0 to 1 inches; slightly decomposed plant material
- Oe—1 to 3 inches; moderately decomposed plant material
- E—3 to 8 inches; gravelly loam
- E/Bt—8 to 14 inches; very cobbly clay
- Bt—14 to 60 inches; very cobbly clay loam

### **Additional Components**

Danaher and similar soils: 5 percent  
Worock and similar soils: 4 percent  
Foolhen and similar soils: 3 percent  
Rock outcrop: 3 percent

## **101B—Philipsburg sandy loam, 1 to 4 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,330 to 5,710 feet  
*Mean annual precipitation:* 12 to 14 inches  
*Frost-free period:* 50 to 70 days

### Component Description

#### **Philipsburg and similar soils**

*Composition:* 90 percent

*Geomorphic description:* Alluvial fan

*Slope:* 1 to 4 percent

*Elevation:* 5,330 to 5,710 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 9.2 inches

*Typical profile:*

A—0 to 9 inches; sandy loam

Bt—9 to 22 inches; clay loam

Bk1—22 to 40 inches; gravelly loam

Bk2—40 to 60 inches; gravelly loam

### Additional Components

Philipsburg, wet and similar soils: 5 percent

Tibson and similar soils: 5 percent

## **102D—Varney, noncalciic-Philipsburg-Varney complex, 2 to 15 percent slopes**

### Map Unit Setting

*Interpretive focus:* Rangeland

*Elevation:* 5,310 to 5,790 feet

*Mean annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 75 days

### Component Description

#### **Varney, noncalciic and similar soils**

*Composition:* 35 percent

*Geomorphic description:*

- Shoulder on hill
- Backslope on hill

*Slope:* 6 to 15 percent

*Elevation:* 5,310 to 5,790 feet

*Effective annual precipitation:* 11 to 13 inches

*Frost-free period:* 55 to 75 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 7.3 inches

*Typical profile:*

- A—0 to 9 inches; sandy loam
- Bt—9 to 25 inches; sandy clay loam
- BC—25 to 44 inches; gravelly sandy loam
- C—44 to 60 inches; gravelly loamy coarse sand

**Philipsburg and similar soils**

- Composition:* 25 percent
- Geomorphic description:* Foothills on hill
- Slope:* 2 to 12 percent, northwest to east aspects
- Elevation:* 5,310 to 5,790 feet
- Effective annual precipitation:* 15 to 17 inches
- Frost-free period:* 50 to 70 days
- Surface layer texture:* Sandy loam
- Depth to restrictive feature:* None noted
- Drainage class:* Well drained
- Parent material:* Loamy alluvium
- Native plant cover type:* Forestland
- Flooding:* None
- Available water capacity:* Mainly 9.2 inches
- Typical profile:*
- A—0 to 9 inches; sandy loam
  - Bt—9 to 22 inches; clay loam
  - Bk1—22 to 40 inches; gravelly loam
  - Bk2—40 to 60 inches; gravelly loam

**Varney and similar soils**

- Composition:* 20 percent
- Geomorphic description:* Foothills on hill
- Slope:* 2 to 12 percent, east to northwest aspects
- Elevation:* 5,310 to 5,790 feet
- Effective annual precipitation:* 11 to 13 inches
- Frost-free period:* 55 to 75 days
- Surface layer texture:* Sandy loam
- Depth to restrictive feature:* None noted
- Drainage class:* Well drained
- Parent material:* Loamy alluvium
- Native plant cover type:* Forestland
- Flooding:* None
- Available water capacity:* Mainly 6.8 inches
- Typical profile:*
- A—0 to 7 inches; sandy loam
  - Bt—7 to 18 inches; gravelly sandy clay loam
  - Bk—18 to 48 inches; gravelly sandy loam
  - C—48 to 60 inches; gravelly loamy coarse sand

**Additional Components**

- Philipsburg, deep and similar soils: 12 percent
- Bearmouth, extremely stony and similar soils: 8 percent

## **106E—Gnojek-Libeg-Philipsburg complex, 8 to 30 percent slopes, stony**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 4,990 to 5,980 feet

*Mean annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 75 days

### **Component Description**

#### **Gnojek, stony and similar soils**

*Composition:* 40 percent

*Geomorphic description:*

- Shoulder on hill
- Backslope on hill

*Slope:* 12 to 30 percent, southeast to west aspects

*Elevation:* 4,990 to 5,980 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 55 to 75 days

*Surface layer texture:* Very channery sandy loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Well drained

*Parent material:* Tertiary volcanic residuum

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.2 inches

*Typical profile:*

- A—0 to 3 inches; very channery sandy loam
- Bt—3 to 10 inches; very channery sandy clay loam
- Bk—10 to 15 inches; very channery sandy loam
- R—15 to 60 inches; bedrock

#### **Libeg, stony and similar soils**

*Composition:* 35 percent

*Geomorphic description:*

- Backslope on hill
- Shoulder on hill

*Slope:* 8 to 25 percent, west to southeast aspects

*Elevation:* 4,990 to 5,980 feet

*Effective annual precipitation:* 15 to 18 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Slope alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 4.9 inches

*Typical profile:*

- A1—0 to 5 inches; gravelly loam
- A2—5 to 11 inches; very cobbly loam

Bt—11 to 23 inches; very gravelly sandy clay loam

C—23 to 60 inches; very gravelly sandy loam

**Philipsburg, stony and similar soils**

*Composition:* 20 percent

*Geomorphic description:*

- Footslope on hill
- Swale

*Slope:* 8 to 15 percent

*Elevation:* 4,990 to 5,980 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Sandy loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Mixed volcanic or granite alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 9.2 inches

*Typical profile:*

A—0 to 9 inches; sandy loam

Bt—9 to 22 inches; clay loam

Bk1—22 to 40 inches; gravelly loam

Bk2—40 to 60 inches; gravelly loam

**Additional Components**

Danielvil, wet and similar soils: 5 percent

**107E—Anaconda-Varney-Work, stony complex, 6 to 30 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,350 to 6,120 feet

*Mean annual precipitation:* 12 to 16 inches

*Frost-free period:* 65 to 80 days

**Component Description**

**Anaconda and similar soils**

*Composition:* 40 percent

*Geomorphic description:*

- Backslope on hill
- Riser on stream terrace

*Slope:* 12 to 30 percent, east to northwest aspects

*Elevation:* 5,350 to 6,120 feet

*Effective annual precipitation:* 11 to 14 inches

*Frost-free period:* 65 to 80 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Coarse-loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 7.8 inches

*Typical profile:*

A—0 to 8 inches; sandy loam

Bw—8 to 14 inches; sandy loam

Bk1—14 to 27 inches; sandy loam

Bk2—27 to 60 inches; sandy loam

**Varney and similar soils**

*Composition:* 30 percent

*Geomorphic description:*

- Footslope on hill
- Riser on stream terrace

*Slope:* 6 to 15 percent, east to northwest aspects

*Elevation:* 5,350 to 6,120 feet

*Effective annual precipitation:* 11 to 14 inches

*Frost-free period:* 65 to 80 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Fine-loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Salt affected:* Saline within 30 inches

*Available water capacity:* Mainly 7.6 inches

*Typical profile:*

A—0 to 7 inches; loam

Bt—7 to 12 inches; gravelly clay loam

Bk—12 to 60 inches; gravelly sandy loam

**Work, stony and similar soils**

*Composition:* 30 percent

*Geomorphic description:*

- Backslope on hill
- Shoulder on hill
- Riser on stream terrace

*Slope:* 12 to 30 percent, east to northwest aspects

*Elevation:* 5,350 to 6,120 feet

*Effective annual precipitation:* 11 to 14 inches

*Frost-free period:* 65 to 80 days

*Surface layer texture:* Loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 33 to 67 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Clayey alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 8.0 inches

*Typical profile:*

A—0 to 7 inches; loam

Bt—7 to 16 inches; clay loam

Bk—16 to 42 inches; loam

BCk—42 to 60 inches; gravelly sandy loam

## **108D—Varney-Work complex, 4 to 15 percent slopes, stony**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,310 to 5,890 feet

*Mean annual precipitation:* 12 to 16 inches

*Frost-free period:* 65 to 85 days

### **Component Description**

#### **Varney, stony and similar soils**

*Composition:* 65 percent

*Geomorphic description:*

- Footslope on hill
- Backslope on hill
- Riser on stream terrace

*Slope:* 4 to 15 percent, east to northwest aspects

*Elevation:* 5,310 to 5,890 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 65 to 85 days

*Surface layer texture:* Loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 33 to 67 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Salt affected:* Saline within 30 inches

*Available water capacity:* Mainly 7.6 inches

*Typical profile:*

A—0 to 7 inches; loam

Bt—7 to 12 inches; gravelly clay loam

Bk—12 to 60 inches; gravelly sandy loam

#### **Work, stony and similar soils**

*Composition:* 30 percent

*Geomorphic description:*

- Shoulder on hill
- Backslope on hill
- Riser on stream terrace

*Slope:* 8 to 15 percent, east to northwest aspects

*Elevation:* 5,310 to 5,890 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 65 to 85 days

*Surface layer texture:* Loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 33 to 67 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Clayey alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 8.0 inches



*Typical profile:*

A—0 to 7 inches; loam  
Bt—7 to 16 inches; clay loam  
Bk—16 to 42 inches; loam  
BCk—42 to 60 inches; gravelly sandy loam

**Additional Components**

Mannixlee and similar soils: 5 percent

**109A—Bearmouth coarse sandy loam, 0 to 4 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,520 to 5,790 feet  
*Mean annual precipitation:* 12 to 16 inches  
*Frost-free period:* 50 to 70 days

**Component Description**

**Bearmouth and similar soils**

*Composition:* 80 percent  
*Geomorphic description:* Fan remnant  
*Slope:* 0 to 4 percent  
*Elevation:* 5,520 to 5,790 feet  
*Effective annual precipitation:* 12 to 16 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Coarse sandy loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Sandy and gravelly alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 2.2 inches  
*Typical profile:*

A—0 to 6 inches; coarse sandy loam  
Bw—6 to 11 inches; gravelly coarse sandy loam  
BC—11 to 18 inches; gravelly coarse sandy loam  
2C1—18 to 34 inches; very cobbly loamy coarse sand  
2C2—34 to 60 inches; very cobbly sand

**Additional Components**

Bearmouth and similar soils: 10 percent  
Sebud and similar soils: 10 percent

**110E—Danielvil-Bearmouth complex, 2 to 25 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,380 to 5,970 feet

*Mean annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Danielvil and similar soils**

*Composition:* 35 percent

*Geomorphic description:*

- Toeslope on hill
- Footslope on hill

*Slope:* 4 to 15 percent

*Elevation:* 5,380 to 5,970 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 6.9 inches

*Typical profile:*

- A1—0 to 5 inches; sandy loam
- A2—5 to 13 inches; loam
- Bw—13 to 23 inches; gravelly sandy loam
- BC—23 to 34 inches; gravelly sandy loam
- 2C—34 to 60 inches; gravelly coarse sandy loam

#### **Bearmouth and similar soils**

*Composition:* 30 percent

*Geomorphic description:*

- Backslope on hill
- Shoulder on hill

*Slope:* 8 to 25 percent

*Elevation:* 5,380 to 5,970 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Sandy and gravelly alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 2.2 inches

*Typical profile:*

- A—0 to 6 inches; gravelly sandy loam
- Bw—6 to 11 inches; gravelly coarse sandy loam
- BC—11 to 18 inches; gravelly coarse sandy loam
- 2C1—18 to 34 inches; very cobbly loamy coarse sand
- 2C2—34 to 60 inches; very cobbly sand

#### **Bearmouth, lesser slopes and similar soils**

*Composition:* 25 percent

*Geomorphic description:* Stream terrace

*Slope:* 2 to 4 percent

*Elevation:* 5,380 to 5,970 feet  
*Effective annual precipitation:* 14 to 16 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Coarse sandy loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Sandy and gravelly alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 2.2 inches  
*Typical profile:*

- A—0 to 6 inches; coarse sandy loam
- Bw—6 to 11 inches; gravelly coarse sandy loam
- BC—11 to 18 inches; gravelly coarse sandy loam
- 2C1—18 to 34 inches; very cobbly loamy coarse sand
- 2C2—34 to 60 inches; very cobbly sand

#### **Additional Components**

Philipsburg, deep and similar soils: 6 percent  
Riverwash: 2 percent  
Rock outcrop: 2 percent

### **111E—Sebud-Philipsburg complex, 8 to 25 percent slopes, bouldery**

#### **Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,890 to 6,360 feet  
*Mean annual precipitation:* 15 to 17 inches  
*Frost-free period:* 50 to 70 days

#### **Component Description**

##### **Sebud, bouldery and similar soils**

*Composition:* 55 percent  
*Geomorphic description:*

- Shoulder on hill
- Backslope on hill

*Slope:* 12 to 25 percent, northwest to east aspects  
*Elevation:* 5,890 to 6,360 feet  
*Effective annual precipitation:* 16 to 19 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Gravelly loam  
*Rock fragments on the soil surface:* 0.01 to 0.10 percent boulders, 100 to 166 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Sandy and gravelly alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 3.8 inches  
*Typical profile:*

- A1—0 to 6 inches; gravelly loam
- A2—6 to 12 inches; very cobbly loam

Bw—12 to 20 inches; very cobbly sandy loam

BC—20 to 30 inches; very cobbly sandy loam

C—30 to 60 inches; very gravelly sandy loam

**Philipsburg, bouldery and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Footslope on hill

*Slope:* 8 to 15 percent, northwest to east aspects

*Elevation:* 5,890 to 6,360 feet

*Effective annual precipitation:* 16 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent boulders, 100 to 166 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 9.2 inches

*Typical profile:*

A—0 to 9 inches; loam

Bt—9 to 22 inches; clay loam

Bk—22 to 40 inches; gravelly loam

BC—40 to 44 inches; gravelly loam

C—44 to 60 inches; gravelly loam

**Additional Components**

Adel and similar soils: 10 percent

**112E—Monaberg-Bridger-Libeg, stony complex, 8 to 25 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,460 to 6,090 feet

*Mean annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

**Component Description**

**Monaberg and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Backslope on hill

*Slope:* 15 to 25 percent, west to southeast aspects

*Elevation:* 5,460 to 6,090 feet

*Effective annual precipitation:* 16 to 20 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 8.3 inches

*Typical profile:*

A—0 to 10 inches; loam

Bt—10 to 28 inches; gravelly sandy clay loam

C—28 to 60 inches; gravelly sandy clay loam

**Bridger and similar soils**

*Composition:* 25 percent

*Geomorphic description:* Footslope on hill

*Slope:* 8 to 15 percent, west to southeast aspects

*Elevation:* 5,460 to 6,090 feet

*Effective annual precipitation:* 16 to 20 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Tertiary volcanic alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 7.9 inches

*Typical profile:*

A1—0 to 3 inches; loam

A2—3 to 9 inches; loam

Bt—9 to 17 inches; clay

Bk—17 to 34 inches; loam

C—34 to 60 inches; sandy loam

**Libeg, stony and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Shoulder on hill

*Slope:* 8 to 25 percent, west to southeast aspects

*Elevation:* 5,460 to 6,090 feet

*Effective annual precipitation:* 16 to 20 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Gravelly alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 4.9 inches

*Typical profile:*

A1—0 to 5 inches; gravelly loam

A2—5 to 11 inches; very cobbly loam

Bt—11 to 23 inches; very gravelly sandy clay loam

C—23 to 60 inches; very gravelly sandy loam

**Additional Components**

Philipsburg, stony and similar soils: 15 percent

Adel and similar soils: 10 percent

## **114B—Varney loam, 0 to 4 percent slopes, moderately impacted**

### **Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,130 to 5,480 feet  
*Mean annual precipitation:* 12 to 14 inches  
*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Varney, moderately impacted and similar soils**

*Composition:* 90 percent  
*Geomorphic description:* Alluvial fan  
*Slope:* 0 to 4 percent  
*Elevation:* 5,130 to 5,480 feet  
*Effective annual precipitation:* 12 to 14 inches  
*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Loamy alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Salt affected:* Saline within 30 inches  
*Available water capacity:* Mainly 7.6 inches  
*Typical profile:*  
    A1—0 to 0 inches; loam  
    A2—0 to 7 inches; loam  
    Bt—7 to 12 inches; gravelly clay loam  
    Bk—12 to 60 inches; gravelly sandy loam

### **Additional Components**

Work, moderately impacted and similar soils: 10 percent

## **115D—Philipsburg-Ratiopeak complex, 8 to 15 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,490 to 6,250 feet  
*Mean annual precipitation:* 15 to 19 inches  
*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Philipsburg and similar soils**

*Composition:* 55 percent  
*Geomorphic description:* Backslope on hill  
*Slope:* 8 to 15 percent  
*Elevation:* 5,500 to 6,250 feet  
*Effective annual precipitation:* 15 to 19 inches  
*Frost-free period:* 50 to 70 days

*Surface layer texture:* Sandy loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Loamy alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 9.2 inches  
*Typical profile:*  
A—0 to 9 inches; sandy loam  
Bt—9 to 22 inches; clay loam  
Bk1—22 to 40 inches; gravelly loam  
Bk2—40 to 60 inches; gravelly loam

**Ratiopeak and similar soils**

*Composition:* 30 percent  
*Geomorphic description:*

- Backslope on hill
- Shoulder on hill

*Slope:* 8 to 15 percent  
*Elevation:* 5,500 to 6,250 feet  
*Effective annual precipitation:* 15 to 19 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Gravelly loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Alluvium derived from quartzite  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 6.3 inches  
*Typical profile:*  
A—0 to 8 inches; gravelly loam  
Bt—8 to 15 inches; very gravelly sandy clay loam  
Bk1—15 to 24 inches; very gravelly loam  
Bk2—24 to 45 inches; very cobbly loam  
BC—45 to 60 inches; very gravelly coarse sandy loam

**Additional Components**

Bearmouth and similar soils: 5 percent  
Bridger and similar soils: 5 percent  
Danielvil and similar soils: 4 percent  
Rock outcrop, granite: 1 percent

**116C—Monaberg-Philipsburg complex, 2 to 8 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,720 to 6,250 feet  
*Mean annual precipitation:* 15 to 17 inches  
*Frost-free period:* 50 to 70 days

### Component Description

#### **Monaberg and similar soils**

*Composition:* 80 percent

*Geomorphic description:* Fan remnant

*Slope:* 2 to 8 percent

*Elevation:* 5,720 to 6,250 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 9.2 inches

*Typical profile:*

A—0 to 9 inches; loam

Bt—9 to 22 inches; clay loam

Bk1—22 to 40 inches; gravelly loam

Bk2—40 to 60 inches; gravelly loam

#### **Philipsburg and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Fan remnant

*Slope:* 2 to 6 percent

*Elevation:* 5,720 to 6,250 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 6.3 inches

*Typical profile:*

A—0 to 8 inches; loam

Bt—8 to 15 inches; very gravelly sandy clay loam

Bk1—15 to 24 inches; very gravelly loam

Bk2—24 to 45 inches; very cobbly loam

BC—45 to 60 inches; very gravelly coarse sandy loam

### Additional Components

Bearmouth and similar soils: 5 percent

## **118E—Reedpoint-Rock outcrop-Sixbeacon complex, 6 to 45 percent slopes**

### Map Unit Setting

*Interpretive focus:* Rangeland

*Elevation:* 5,430 to 6,040 feet



*Mean annual precipitation:* 10 to 14 inches

*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Reedpoint and similar soils**

*Composition:* 60 percent

*Geomorphic description:*

- Shoulder on hill
- Backslope on hill

*Slope:* 15 to 45 percent

*Elevation:* 5,430 to 6,040 feet

*Effective annual precipitation:* 10 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Very cobbly sandy loam

*Depth to restrictive feature:* Lithic bedrock: 3 to 10 inches

*Drainage class:* Well drained

*Parent material:* Consolidated tertiary residuum

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 0.3 inches

*Typical profile:*

- A—0 to 4 inches; very cobbly sandy loam
- BC—4 to 5 inches; very gravelly sandy loam
- R—5 to 60 inches; bedrock

#### **Rock outcrop, consolidated tertiary deposits**

*Composition:* 25 percent

*Geomorphic description:*

- Shoulder on hill
- Backslope on hill

#### **Sixbeacon and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Footslope on hill

*Slope:* 6 to 15 percent

*Elevation:* 5,430 to 6,040 feet

*Effective annual precipitation:* 10 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Gravelly loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Slope alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 4.9 inches

*Typical profile:*

- A—0 to 6 inches; gravelly loam
- Bw—6 to 12 inches; very cobbly loam
- Bk1—12 to 35 inches; very gravelly loam
- Bk2—35 to 60 inches; very gravelly sandy loam

## **119C—Varney-Udecide complex, 2 to 12 percent slopes, moderately impacted**

### **Map Unit Setting**

*Interpretive focus:* rangeland

*Elevation:* 5,300 to 5,720 feet

*Mean annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Varney, moderately impacted and similar soils**

*Composition:* 80 percent

*Geomorphic description:* Footslope on low hill

*Slope:* 2 to 8 percent

*Elevation:* 5,300 to 5,720 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 6.8 inches

*Typical profile:*

A1—0 to 0 inches; sandy loam

A2—0 to 7 inches; sandy loam

Bt—7 to 18 inches; gravelly sandy clay loam

Bk—18 to 48 inches; gravelly sandy loam

C—48 to 60 inches; gravelly loamy coarse sand

#### **Udecide, moderately impacted and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Shoulder on low hill

*Slope:* 6 to 12 percent

*Elevation:* 5,300 to 5,720 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:* Paralithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Loamy alluvium over tertiary residuum

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.7 inches

*Typical profile:*

A1—0 to 0 inches; sandy loam

A2—0 to 9 inches; sandy loam

Bt—9 to 17 inches; sandy clay loam

Bk—17 to 29 inches; sandy loam

BC—29 to 45 inches; gravelly sandy loam

Cr—45 to 60 inches; bedrock

### **Additional Components**

Meadowcreek, moderately impacted and similar soils: 5 percent

## **120C—Varney-Anamac complex, 2 to 8 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,330 to 5,530 feet

*Mean annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Varney and similar soils**

*Composition:* 50 percent

*Geomorphic description:* Footslope on low hill

*Slope:* 2 to 8 percent

*Elevation:* 5,330 to 5,530 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 6.8 inches

*Typical profile:*

A—0 to 7 inches; sandy loam

Bt—7 to 18 inches; gravelly sandy clay loam

Bk—18 to 48 inches; gravelly sandy loam

C—48 to 60 inches; gravelly loamy coarse sand

#### **Anamac and similar soils**

*Composition:* 40 percent

*Geomorphic description:*

- Footslope on low hill

- Swale

*Slope:* 2 to 6 percent

*Elevation:* 5,330 to 5,530 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 7.0 inches

*Typical profile:*

A—0 to 8 inches; loam

Bw—8 to 15 inches; loam

Bk1—15 to 28 inches; loam

Bk2—28 to 38 inches; gravelly loam

C—38 to 60 inches; very gravelly sandy loam

### **Additional Components**

Udecide, deep and similar soils: 8 percent

Meadowcreek and similar soils: 2 percent

## **122C—Varney-Work complex, 2 to 8 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,270 to 5,660 feet

*Mean annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Varney and similar soils**

*Composition:* 60 percent

*Geomorphic description:* Dissected fan remnant

*Slope:* 2 to 8 percent

*Elevation:* 5,270 to 5,660 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Salt affected:* Saline within 30 inches

*Available water capacity:* Mainly 7.6 inches

*Typical profile:*

A—0 to 7 inches; sandy loam

Bt—7 to 12 inches; gravelly clay loam

Bk—12 to 60 inches; gravelly sandy loam

#### **Work and similar soils**

*Composition:* 25 percent

*Geomorphic description:* Dissected fan remnant

*Slope:* 2 to 8 percent

*Elevation:* 5,270 to 5,660 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Sandy clay loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Clayey alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 8.0 inches

*Typical profile:*

A—0 to 7 inches; sandy clay loam

Bt—7 to 16 inches; clay loam

Bk—16 to 42 inches; loam

BCK—42 to 60 inches; gravelly sandy loam

### **Additional Components**

Udecide, deep and similar soils: 10 percent

Patouza, deep and similar soils: 5 percent

## **123E—Sebud, stony-Danielvil-Monaberg, very stony complex, 8 to 30 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,380 to 6,380 feet

*Mean annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 80 days

### **Component Description**

#### **Sebud, stony and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Backslope on hill

*Slope:* 12 to 25 percent

*Elevation:* 5,460 to 6,380 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Sandy and gravelly alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.8 inches

*Typical profile:*

A1—0 to 6 inches; gravelly loam

A2—6 to 12 inches; very cobbly loam

Bw—12 to 20 inches; very cobbly sandy loam

BC—20 to 30 inches; very cobbly sandy loam

C—30 to 60 inches; very gravelly sandy loam

#### **Danielvil and similar soils**

*Composition:* 25 percent

*Geomorphic description:* Backslope on hill

*Slope:* 12 to 25 percent, west to southeast aspects

*Elevation:* 5,380 to 5,970 feet

*Effective annual precipitation:* 16 to 20 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 6.9 inches

*Typical profile:*

A1—0 to 5 inches; sandy loam

A2—5 to 13 inches; loam

Bw—13 to 23 inches; gravelly sandy loam

BC—23 to 34 inches; gravelly sandy loam

2C—34 to 60 inches; gravelly coarse sandy loam

**Monaberg, very stony and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Shoulder on hill

*Slope:* 15 to 30 percent

*Elevation:* 5,460 to 6,380 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Rock fragments on the soil surface:* 0.20 to 3.00 percent stones, 10 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Mixed volcanic or granite alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 8.3 inches

*Typical profile:*

A—0 to 10 inches; loam

Bt—10 to 28 inches; gravelly sandy clay loam

C—28 to 60 inches; gravelly sandy clay loam

**Philipsburg, stony and similar soils**

*Composition:* 20 percent

*Geomorphic description:*

- Footslope on hill
- Swale

*Slope:* 8 to 15 percent

*Elevation:* 5,460 to 6,380 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Sandy loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Mixed volcanic or granite alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 9.2 inches

*Typical profile:*

A—0 to 9 inches; sandy loam

Bt—9 to 22 inches; clay loam

Bk1—22 to 40 inches; gravelly loam

Bk2—40 to 60 inches; gravelly loam

**Additional Components**

Gnojek, stony and similar soils: 3 percent

Bearmouth, extremely stony and similar soils: 2 percent

## **124E—Monaberg-Bridger complex, 8 to 30 percent slopes, very stony**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,630 to 6,580 feet

*Mean annual precipitation:* 14 to 19 inches

*Frost-free period:* 30 to 70 days

### **Component Description**

#### **Monaberg, very stony and similar soils**

*Composition:* 55 percent

*Geomorphic description:*

- Backslope on hill
- Shoulder on hill

*Slope:* 8 to 30 percent, west to southeast aspects

*Elevation:* 5,630 to 6,580 feet

*Effective annual precipitation:* 16 to 20 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Loam

*Rock fragments on the soil surface:* 0.20 to 3.00 percent stones, 10 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Mixed volcanic or granite alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 8.3 inches

*Typical profile:*

A—0 to 10 inches; loam

Bt—10 to 28 inches; gravelly sandy clay loam

C—28 to 60 inches; gravelly sandy clay loam

#### **Bridger, very stony and similar soils**

*Composition:* 20 percent

*Geomorphic description:*

- Footslope on hill
- Swale

*Slope:* 8 to 15 percent, west to southeast aspects

*Elevation:* 5,630 to 6,580 feet

*Effective annual precipitation:* 16 to 20 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Loam

*Rock fragments on the soil surface:* 0.20 to 3.00 percent stones, 10 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Tertiary volcanic alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 7.9 inches

*Typical profile:*

A1—0 to 3 inches; loam

A2—3 to 9 inches; loam

Bt—9 to 17 inches; clay

Bk—17 to 34 inches; loam

C—34 to 60 inches; sandy loam

### **Additional Components**

Monaberg, very stony, greater slopes and similar soils: 10 percent

Sebud, stony and similar soils: 10 percent

Gnojek, stony and similar soils: 5 percent

## **125E—Libeg-Monaberg complex, 15 to 35 percent slopes, very bouldery**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 6,120 to 6,250 feet

*Mean annual precipitation:* 15 to 19 inches

*Frost-free period:* 40 to 70 days

### **Component Description**

#### **Libeg, very bouldery and similar soils**

*Composition:* 65 percent

*Geomorphic description:*

- Backslope on hill
- Shoulder on hill

*Slope:* 15 to 35 percent, east to northwest aspects

*Elevation:* 6,120 to 6,250 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly loam

*Rock fragments on the soil surface:* 0.20 to 3.00 percent boulders, 10 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Gravelly granite alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 4.9 inches

*Typical profile:*

A1—0 to 5 inches; gravelly loam

A2—5 to 11 inches; very cobbly loam

Bt—11 to 23 inches; very gravelly sandy clay loam

C—23 to 60 inches; very gravelly sandy loam

#### **Monaberg, very bouldery and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Backslope on hill

*Slope:* 15 to 35 percent, east to northwest aspects

*Elevation:* 6,120 to 6,250 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Cobbly loam

*Rock fragments on the soil surface:* 0.20 to 3.00 percent boulders, 10 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained



*Parent material:* Granite alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 8.3 inches

*Typical profile:*

A—0 to 10 inches; cobbly loam

Bt—10 to 28 inches; gravelly sandy clay loam

C—28 to 60 inches; gravelly sandy clay loam

#### **Additional Components**

Adel and similar soils: 5 percent

### **126E—Danielvil, very bouldery-Monaberg, bouldery-Adel complex, 8 to 35 percent slopes**

#### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,560 to 6,180 feet

*Mean annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 75 days

#### **Component Description**

##### **Danielvil, very bouldery and similar soils**

*Composition:* 50 percent

*Geomorphic description:*

- Backslope on moraines
- Shoulder on moraines

*Slope:* 15 to 35 percent, east to west aspects

*Elevation:* 5,560 to 6,180 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 55 to 75 days

*Surface layer texture:* Sandy loam

*Rock fragments on the soil surface:* 0.20 to 3.00 percent boulders, 10 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Till

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 6.9 inches

*Typical profile:*

A1—0 to 5 inches; sandy loam

A2—5 to 13 inches; loam

Bw—13 to 23 inches; gravelly sandy loam

BC—23 to 34 inches; gravelly sandy loam

2C—34 to 60 inches; gravelly coarse sandy loam

##### **Monaberg, bouldery and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Backslope on moraines

*Slope:* 15 to 35 percent, west to southeast aspects

*Elevation:* 5,560 to 6,180 feet

*Effective annual precipitation:* 17 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent boulders, 10 to 30 feet apart

*Drainage class:* Well drained

*Parent material:* Till

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 8.3 inches

*Typical profile:*

A—0 to 10 inches; loam

Bt—10 to 28 inches; gravelly sandy clay loam

C—28 to 60 inches; gravelly sandy clay loam

#### **Adel and similar soils**

*Composition:* 15 percent

*Geomorphic description:*

- Backslope on moraines
- Swales

*Slope:* 8 to 25 percent

*Elevation:* 5,560 to 6,180 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Till

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 9.4 inches

*Typical profile:*

A1—0 to 9 inches; loam

A2—9 to 18 inches; loam

Bw—18 to 28 inches; gravelly loam

C—28 to 60 inches; gravelly loam

## **128D—Monaberg loam, 4 to 15 percent slopes, bouldery**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,690 to 6,250 feet

*Mean annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Monaberg, bouldery and similar soils**

*Composition:* 85 percent

*Geomorphic description:* Backslope on hill

*Slope:* 4 to 15 percent, west to southeast aspects

*Elevation:* 5,690 to 6,250 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent boulders, 10 to 30 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Till

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 8.3 inches

*Typical profile:*

A—0 to 10 inches; loam

Bt—10 to 28 inches; gravelly sandy clay loam

C—28 to 60 inches; gravelly sandy clay loam

### **Additional Components**

Danielvil, bouldery and similar soils: 10 percent

Libeg, bouldery and similar soils: 5 percent

## **129D—Philipsburg-Danielvil complex, 4 to 15 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,400 to 5,720 feet

*Mean annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Philipsburg and similar soils**

*Composition:* 65 percent

*Geomorphic description:*

- Footslope on dissected alluvial fan
- Toeslope on dissected alluvial fan

*Slope:* 4 to 8 percent

*Elevation:* 5,400 to 5,720 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 9.2 inches

*Typical profile:*

A—0 to 9 inches; loam

Bt—9 to 22 inches; clay loam

Bk1—22 to 40 inches; gravelly loam

Bk2—40 to 60 inches; gravelly loam

#### **Danielvil and similar soils**

*Composition:* 25 percent

*Geomorphic description:*

- Footslope on dissected alluvial fan
- Shoulder on dissected alluvial fan

*Slope:* 4 to 15 percent  
*Elevation:* 5,400 to 5,720 feet  
*Effective annual precipitation:* 14 to 16 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Loamy alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 6.9 inches  
*Typical profile:*  
    A1—0 to 5 inches; loam  
    A2—5 to 13 inches; loam  
    Bw—13 to 23 inches; gravelly sandy loam  
    BC—23 to 34 inches; gravelly sandy loam  
    2C—34 to 60 inches; gravelly coarse sandy loam

#### **Additional Components**

Bearmouth and similar soils: 8 percent  
Philipsburg, very stony and similar soils: 2 percent

### **131E—Dumps, placer mining-Philipsburg, stony complex, 4 to 15 percent slopes**

#### **Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,360 to 5,610 feet  
*Mean annual precipitation:* 14 to 16 inches  
*Frost-free period:* 50 to 70 days

#### **Component Description**

##### **Dumps, placer mining**

*Composition:* 50 percent

##### **Philipsburg, stony and similar soils**

*Composition:* 45 percent

*Geomorphic description:*

- Footslope on mined hill
- Toeslope on mined hill
- Backslope on mined hill

*Slope:* 4 to 15 percent  
*Elevation:* 5,360 to 5,610 feet  
*Effective annual precipitation:* 14 to 16 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Loam  
*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Loamy alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None

*Available water capacity:* Mainly 9.2 inches

*Typical profile:*

A—0 to 9 inches; loam

Bt—9 to 22 inches; clay loam

Bk1—22 to 40 inches; gravelly loam

Bk2—40 to 60 inches; gravelly loam

### **Additional Components**

Bearmouth and similar soils: 5 percent

## **136D—Varney-Varney, stony-Anamac complex, 2 to 12 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,350 to 5,640 feet

*Mean annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Varney and similar soils**

*Composition:* 35 percent

*Geomorphic description:*

- Shoulder on hill
- Backslope on hill

*Slope:* 2 to 8 percent

*Elevation:* 5,350 to 5,640 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 7.3 inches

*Typical profile:*

A—0 to 9 inches; sandy loam

Bt—9 to 25 inches; sandy clay loam

BC—25 to 44 inches; gravelly sandy loam

C—44 to 60 inches; gravelly loamy coarse sand

#### **Varney, stony and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Dissected fan remnant

*Slope:* 6 to 12 percent

*Elevation:* 5,350 to 5,640 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Gravelly loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained  
*Parent material:* Loamy alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 6.8 inches  
*Typical profile:*  
A—0 to 7 inches; gravelly loam  
Bt—7 to 18 inches; gravelly sandy clay loam  
Bk—18 to 48 inches; gravelly sandy loam  
C—48 to 60 inches; gravelly loamy coarse sand

**Anamac and similar soils**

*Composition:* 15 percent  
*Geomorphic description:* Dissected fan remnant  
*Slope:* 4 to 12 percent  
*Elevation:* 5,350 to 5,640 feet  
*Effective annual precipitation:* 12 to 14 inches  
*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Sandy loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Coarse loamy alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 7.0 inches  
*Typical profile:*  
A—0 to 8 inches; sandy loam  
Bw—8 to 15 inches; loam  
Bk1—15 to 28 inches; loam  
Bk2—28 to 38 inches; gravelly loam  
C—38 to 60 inches; very gravelly sandy loam

**Additional Components**

Sixbeacon, very stony and similar soils: 10 percent  
Rivra and similar soils: 5 percent

**139D—Beeftrail, occasionally flooded-Adel-Monaberg complex, 4 to 15 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,460 to 6,020 feet  
*Mean annual precipitation:* 15 to 17 inches  
*Frost-free period:* 50 to 70 days

**Component Description**

**Beeftrail and similar soils**

*Composition:* 45 percent  
*Geomorphic description:* Backslope on hill  
*Slope:* 6 to 15 percent  
*Elevation:* 5,460 to 6,020 feet  
*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly coarse sandy loam

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 28 to 56 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* Occasional

*Available water capacity:* Mainly 2.1 inches

*Typical profile:*

A—0 to 7 inches; gravelly coarse sandy loam

Bw—7 to 14 inches; gravelly coarse sandy loam

BC—14 to 26 inches; gravelly loamy coarse sand

Cr—26 to 35 inches; bedrock

R—35 to 45 inches; bedrock

### **Adel and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Foothill on hill

*Slope:* 4 to 8 percent

*Elevation:* 5,460 to 6,020 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 9.4 inches

*Typical profile:*

A1—0 to 9 inches; loam

A2—9 to 18 inches; loam

Bw—18 to 28 inches; gravelly loam

C—28 to 60 inches; gravelly loam

### **Monaberg and similar soils**

*Composition:* 20 percent

*Geomorphic description:*

- Backslope on hill
- Summit on hill
- Shoulder on hill

*Slope:* 4 to 15 percent

*Elevation:* 5,460 to 6,020 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 8.3 inches

*Typical profile:*

- A—0 to 10 inches; loam
- Bt—10 to 28 inches; gravelly sandy clay loam
- C—28 to 60 inches; gravelly sandy clay loam

**Additional Components**

Danielvil, wet and similar soils: 12 percent  
Foxgulch and similar soils: 3 percent

**140D—Monaberg-Adel complex, 4 to 20 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,560 to 6,280 feet  
*Mean annual precipitation:* 15 to 19 inches  
*Frost-free period:* 50 to 70 days

**Component Description**

**Monaberg and similar soils**

*Composition:* 75 percent  
*Geomorphic description:* Backslope on hill  
*Slope:* 4 to 20 percent, west to southeast aspects  
*Elevation:* 5,560 to 6,280 feet  
*Effective annual precipitation:* 15 to 19 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Loamy alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 8.3 inches  
*Typical profile:*

- A—0 to 10 inches; loam
- Bt—10 to 28 inches; gravelly sandy clay loam
- C—28 to 60 inches; gravelly sandy clay loam

**Adel and similar soils**

*Composition:* 15 percent  
*Geomorphic description:* Swales on hill  
*Slope:* 4 to 15 percent, west to southeast aspects  
*Elevation:* 5,560 to 6,280 feet  
*Effective annual precipitation:* 15 to 19 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Loamy alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 9.4 inches



*Typical profile:*

- A1—0 to 9 inches; loam
- A2—9 to 18 inches; loam
- Bw—18 to 28 inches; gravelly loam
- C—28 to 60 inches; gravelly loam

**Additional Components**

Monaberg, bouldery and similar soils: 10 percent

**141F—Danielvil-Danielvil, cool-Philipsburg complex,  
15 to 45 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,590 to 6,180 feet  
*Mean annual precipitation:* 15 to 17 inches  
*Frost-free period:* 45 to 75 days

**Component Description**

**Danielvil and similar soils**

*Composition:* 50 percent  
*Geomorphic description:* Backslope on south-facing escarpment  
*Slope:* 25 to 45 percent, east to northwest aspects  
*Elevation:* 5,590 to 6,180 feet  
*Effective annual precipitation:* 14 to 16 inches  
*Frost-free period:* 55 to 75 days  
*Surface layer texture:* Sandy loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Loamy alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 6.9 inches  
*Typical profile:*

- A1—0 to 5 inches; sandy loam
- A2—5 to 13 inches; loam
- Bw—13 to 23 inches; gravelly sandy loam
- BC—23 to 34 inches; gravelly sandy loam
- 2C—34 to 60 inches; gravelly coarse sandy loam

**Danielvil, cool and similar soils**

*Composition:* 25 percent  
*Geomorphic description:* Backslope on north-facing escarpment  
*Slope:* 25 to 45 percent, northwest to southeast aspects  
*Elevation:* 5,590 to 6,180 feet  
*Effective annual precipitation:* 16 to 19 inches  
*Frost-free period:* 45 to 65 days  
*Surface layer texture:* Sandy loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Loamy alluvium  
*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 6.9 inches

*Typical profile:*

A1—0 to 5 inches; sandy loam

A2—5 to 13 inches; loam

Bw—13 to 23 inches; gravelly sandy loam

BC—23 to 34 inches; gravelly sandy loam

2C—34 to 60 inches; gravelly coarse sandy loam

**Philipsburg and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Footslope on escarpment

*Slope:* 15 to 35 percent

*Elevation:* 5,590 to 6,180 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 9.2 inches

*Typical profile:*

A—0 to 9 inches; sandy loam

Bt—9 to 22 inches; clay loam

Bk1—22 to 40 inches; gravelly loam

Bk2—40 to 60 inches; gravelly loam

**Additional Components**

Libeg, very stony and similar soils: 5 percent

**142E—Ratiopeak-Philipsburg complex, 15 to 35 percent slopes, very stony**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,360 to 6,870 feet

*Mean annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

**Component Description**

**Ratiopeak, very stony and similar soils**

*Composition:* 60 percent

*Geomorphic description:* Backslope on escarpment

*Slope:* 20 to 35 percent, east to northwest aspects

*Elevation:* 5,360 to 6,870 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very cobbly loam

*Rock fragments on the soil surface:* 0.10 to 2.00 percent stones, 7 to 30 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium derived from quartzite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 6.3 inches

*Typical profile:*

A—0 to 8 inches; very cobbly loam

Bt—8 to 15 inches; very gravelly sandy clay loam

Bk1—15 to 24 inches; very gravelly loam

Bk2—24 to 45 inches; very cobbly loam

BC—45 to 60 inches; very gravelly coarse sandy loam

### **Philipsburg, very stony and similar soils**

*Composition:* 25 percent

*Geomorphic description:* Tread footslope on escarpment

*Slope:* 15 to 30 percent, east to northwest aspects

*Elevation:* 5,360 to 6,870 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Cobbly loam

*Rock fragments on the soil surface:* 0.10 to 2.00 percent stones, 7 to 30 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 9.2 inches

*Typical profile:*

A—0 to 9 inches; cobbly loam

Bt—9 to 22 inches; clay loam

Bk1—22 to 40 inches; gravelly loam

Bk2—40 to 60 inches; gravelly loam

### **Additional Components**

Bridger and similar soils: 10 percent

Ratiopeak, very stony, greater slopes and similar soils: 5 percent

## **145D—Danielvil-Philipsburg complex, 4 to 12 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,480 to 5,990 feet

*Mean annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Danielvil and similar soils**

*Composition:* 50 percent

*Geomorphic description:*

- Backslope on dissected alluvial fan
- Shoulder on dissected alluvial fan

*Slope:* 4 to 12 percent  
*Elevation:* 5,480 to 5,990 feet  
*Effective annual precipitation:* 15 to 17 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Sandy loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Loamy alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 6.9 inches  
*Typical profile:*  
A1—0 to 5 inches; sandy loam  
A2—5 to 13 inches; loam  
Bw—13 to 23 inches; gravelly sandy loam  
BC—23 to 34 inches; gravelly sandy loam  
2C—34 to 60 inches; gravelly coarse sandy loam

**Philipsburg and similar soils**

*Composition:* 40 percent  
*Geomorphic description:*

- Toeslope on dissected alluvial fan
- Footslope on dissected alluvial fan

*Slope:* 4 to 8 percent  
*Elevation:* 5,480 to 5,990 feet  
*Effective annual precipitation:* 15 to 17 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Sandy loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Loamy alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 9.2 inches  
*Typical profile:*  
A—0 to 9 inches; sandy loam  
Bt—9 to 22 inches; clay loam  
Bk1—22 to 40 inches; gravelly loam  
Bk2—40 to 60 inches; gravelly loam

**Additional Components**

Bearmouth and similar soils: 7 percent  
Mooseflat and similar soils: 3 percent

**147B—Philipsburg-Ratiopeak complex, 1 to 6 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,460 to 5,940 feet  
*Mean annual precipitation:* 14 to 16 inches  
*Frost-free period:* 50 to 70 days

### Component Description

#### **Philipsburg and similar soils**

*Composition:* 65 percent

*Geomorphic description:* Fan remnant

*Slope:* 1 to 6 percent

*Elevation:* 5,460 to 5,940 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 9.2 inches

*Typical profile:*

A—0 to 9 inches; sandy loam

Bt—9 to 22 inches; clay loam

Bk1—22 to 40 inches; gravelly loam

Bk2—40 to 60 inches; gravelly loam

#### **Ratiopeak and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Fan remnant

*Slope:* 1 to 6 percent

*Elevation:* 5,460 to 5,940 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium derived from quartzite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 6.3 inches

*Typical profile:*

A—0 to 8 inches; gravelly loam

Bt—8 to 15 inches; very gravelly sandy clay loam

Bk1—15 to 24 inches; very gravelly loam

Bk2—24 to 45 inches; very cobbly loam

BC—45 to 60 inches; very gravelly coarse sandy loam

### Additional Components

Adel and similar soils: 3 percent

Ratiopeak, greater slopes and similar soils: 2 percent

## **148C—Philipsburg-Monaberg complex, 2 to 8 percent slopes**

### Map Unit Setting

*Interpretive focus:* Rangeland

*Elevation:* 5,300 to 6,050 feet

*Mean annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Philipsburg and similar soils**

*Composition:* 65 percent

*Geomorphic description:* Fan remnant

*Slope:* 2 to 6 percent

*Elevation:* 5,300 to 6,050 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Mixed volcanic or granite alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 9.2 inches

*Typical profile:*

A—0 to 9 inches; sandy loam

Bt—9 to 22 inches; clay loam

Bk1—22 to 40 inches; gravelly loam

Bk2—40 to 60 inches; gravelly loam

#### **Monaberg and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Fan remnant

*Slope:* 2 to 8 percent

*Elevation:* 5,300 to 6,050 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Mixed volcanic or granite alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 8.3 inches

*Typical profile:*

A—0 to 10 inches; loam

Bt—10 to 28 inches; gravelly sandy clay loam

C—28 to 60 inches; gravelly sandy clay loam

### **Additional Components**

Adel and similar soils: 7 percent

Philipsburg, greater slopes, stony and similar soils: 5 percent

Foolhen and similar soils: 3 percent

## **149D—Bridger-Libeg complex, 8 to 25 percent slopes, very stony**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,480 to 6,660 feet

*Mean annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Bridger, very stony and similar soils**

*Composition:* 65 percent

*Geomorphic description:* Fan remnant

*Slope:* 8 to 15 percent

*Elevation:* 5,480 to 6,660 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very cobbly loam

*Rock fragments on the soil surface:* 0.20 to 3.00 percent stones, 10 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Tertiary volcanic alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 7.9 inches

*Typical profile:*

A1—0 to 3 inches; very cobbly loam

A2—3 to 9 inches; loam

Bt—9 to 17 inches; clay

Bk—17 to 34 inches; loam

C—34 to 60 inches; sandy loam

#### **Libeg, very stony and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Fan remnant

*Slope:* 8 to 25 percent

*Elevation:* 5,480 to 6,660 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Extremely cobbly loam

*Rock fragments on the soil surface:* 0.20 to 3.00 percent stones, 10 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Gravelly alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 4.9 inches

*Typical profile:*

A1—0 to 5 inches; extremely cobbly loam

A2—5 to 11 inches; very cobbly loam

Bt—11 to 23 inches; very gravelly sandy clay loam

C—23 to 60 inches; very gravelly sandy loam

### **Additional Components**

Mawspring, very stony and similar soils: 10 percent  
Adel and similar soils: 5 percent

## **150D—Sebud, very stony-Ratiopeak, stony-Bridger, stony complex, 4 to 15 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,450 to 6,270 feet  
*Mean annual precipitation:* 14 to 16 inches  
*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Sebud, very stony and similar soils**

*Composition:* 45 percent  
*Geomorphic description:* Fan remnant  
*Slope:* 4 to 15 percent, west to southeast aspects  
*Elevation:* 5,450 to 6,270 feet  
*Effective annual precipitation:* 15 to 17 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Very cobbly loam  
*Rock fragments on the soil surface:* 0.10 to 2.00 percent stones, 13 to 30 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Sandy and gravelly alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 3.8 inches  
*Typical profile:*  
    A1—0 to 6 inches; very cobbly loam  
    A2—6 to 12 inches; very cobbly loam  
    Bw—12 to 20 inches; very cobbly sandy loam  
    BC—20 to 30 inches; very cobbly sandy loam  
    C—30 to 60 inches; very gravelly sandy loam

#### **Ratiopeak, stony and similar soils**

*Composition:* 25 percent  
*Geomorphic description:*

- Shoulder on escarpment
- Backslope on escarpment

*Slope:* 4 to 15 percent, east to northwest aspects  
*Elevation:* 5,450 to 6,270 feet  
*Effective annual precipitation:* 13 to 15 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Very cobbly loam  
*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 30 to 100 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Alluvium derived from quartzite  
*Native plant cover type:* Rangeland  
*Flooding:* None



*Available water capacity:* Mainly 6.3 inches

*Typical profile:*

A—0 to 8 inches; very cobbly loam

Bt—8 to 15 inches; very gravelly sandy clay loam

Bk1—15 to 24 inches; very gravelly loam

Bk2—24 to 45 inches; very cobbly loam

BC—45 to 60 inches; very gravelly coarse sandy loam

**Bridger, stony and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Fan remnant

*Slope:* 4 to 15 percent, east to northwest aspects

*Elevation:* 5,450 to 6,270 feet

*Effective annual precipitation:* 13 to 15 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Cobbly loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 150 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Tertiary volcanic alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 7.9 inches

*Typical profile:*

A1—0 to 3 inches; cobbly loam

A2—3 to 9 inches; loam

Bt—9 to 17 inches; clay

Bk—17 to 34 inches; loam

C—34 to 60 inches; sandy loam

**Additional Components**

Adel and similar soils: 9 percent

Ratiopeak, very stony and similar soils: 6 percent

**152E—Sieben-Varney complex, 15 to 45 percent slopes,  
very stony**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,300 to 6,390 feet

*Mean annual precipitation:* 12 to 15 inches

*Frost-free period:* 65 to 85 days

**Component Description**

**Sieben, very stony and similar soils**

*Composition:* 55 percent

*Geomorphic description:*

- Shoulder on hill
- Backslope on hill

*Slope:* 15 to 45 percent, east to northwest aspects

*Elevation:* 5,300 to 6,390 feet

*Effective annual precipitation:* 10 to 14 inches

*Frost-free period:* 65 to 85 days

*Surface layer texture:* Cobbly loam

*Rock fragments on the soil surface:* 0.20 to 3.00 percent stones, 10 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 4.2 inches

*Typical profile:*

A—0 to 5 inches; cobbly loam

Bt—5 to 12 inches; very gravelly sandy clay loam

Bk1—12 to 25 inches; very gravelly sandy loam

Bk2—25 to 60 inches; very gravelly sandy loam

### **Varney, very stony and similar soils**

*Composition:* 20 percent

*Geomorphic description:*

- Shoulder on hill
- Backslope on hill

*Slope:* 15 to 45 percent, east to northwest aspects

*Elevation:* 5,300 to 6,390 feet

*Effective annual precipitation:* 10 to 14 inches

*Frost-free period:* 65 to 85 days

*Surface layer texture:* Channery sandy loam

*Rock fragments on the soil surface:* 0.20 to 3.00 percent stones, 10 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Salt affected:* Saline within 30 inches

*Available water capacity:* Mainly 7.6 inches

*Typical profile:*

A—0 to 7 inches; channery sandy loam

Bt—7 to 12 inches; gravelly clay loam

Bk—12 to 60 inches; gravelly sandy loam

### **Additional Components**

Sieben, extremely stony and similar soils: 11 percent

Patouza, very stony and similar soils: 10 percent

Meadowcreek and similar soils: 2 percent

Rock outcrop: 2 percent

## **153D—Sebud, very stony-Philipsburg-Ratiopeak, very stony complex, 4 to 15 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,680 to 6,250 feet

*Mean annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

## Component Description

### **Sebud, very stony and similar soils**

*Composition:* 40 percent

*Geomorphic description:* Fan remnant

*Slope:* 4 to 15 percent, west to southeast aspects

*Elevation:* 5,680 to 6,250 feet

*Effective annual precipitation:* 16 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very cobbly loam

*Rock fragments on the soil surface:* 0.10 to 2.00 percent stones, 13 to 30 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Sandy and gravelly alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.8 inches

*Typical profile:*

A1—0 to 6 inches; very cobbly loam

A2—6 to 12 inches; very cobbly loam

Bw—12 to 20 inches; very cobbly sandy loam

BC—20 to 30 inches; very cobbly sandy loam

C—30 to 60 inches; very gravelly sandy loam

### **Philipsburg, wet and similar soils**

*Composition:* 25 percent

*Geomorphic description:* Fan remnant

*Slope:* 4 to 6 percent

*Elevation:* 5,680 to 6,250 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly loam

*Depth to restrictive feature:* None noted

*Drainage class:* Moderately well drained

*Parent material:* Loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Water table:* Present

*Available water capacity:* Mainly 9.2 inches

*Typical profile:*

A—0 to 9 inches; gravelly loam

Bt—9 to 22 inches; clay loam

Bk—22 to 40 inches; gravelly loam

BC—40 to 44 inches; gravelly loam

C—44 to 60 inches; gravelly loam

### **Ratiopeak, very stony and similar soils**

*Composition:* 25 percent

*Geomorphic description:*

- Shoulder on escarpment
- Backslope on escarpment

*Slope:* 4 to 15 percent, east to northwest aspects

*Elevation:* 5,680 to 6,250 feet

*Effective annual precipitation:* 13 to 15 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very cobbly loam  
*Rock fragments on the soil surface:* 0.10 to 2.00 percent stones, 13 to 30 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Alluvium derived from quartzite  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 6.3 inches  
*Typical profile:*  
A—0 to 8 inches; very cobbly loam  
Bt—8 to 15 inches; very gravelly sandy clay loam  
Bk1—15 to 24 inches; very gravelly loam  
Bk2—24 to 45 inches; very cobbly loam  
BC—45 to 60 inches; very gravelly coarse sandy loam

#### **Additional Components**

Adel and similar soils: 10 percent

### **158C—Varney-Anamac-Anaconda complex, 2 to 8 percent slopes**

#### **Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,230 to 6,050 feet  
*Mean annual precipitation:* 12 to 14 inches  
*Frost-free period:* 70 to 90 days

#### **Component Description**

##### **Varney and similar soils**

*Composition:* 40 percent  
*Geomorphic description:* Fan remnant  
*Slope:* 2 to 8 percent  
*Elevation:* 5,230 to 6,050 feet  
*Effective annual precipitation:* 12 to 14 inches  
*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Sandy loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Loamy alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 6.8 inches  
*Typical profile:*  
A—0 to 7 inches; sandy loam  
Bt—7 to 18 inches; gravelly sandy clay loam  
Bk—18 to 48 inches; gravelly sandy loam  
C—48 to 60 inches; gravelly loamy coarse sand

##### **Anamac and similar soils**

*Composition:* 35 percent  
*Geomorphic description:* Fan remnant  
*Slope:* 2 to 6 percent

*Elevation:* 5,230 to 6,050 feet  
*Effective annual precipitation:* 12 to 14 inches  
*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Loamy alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 7.0 inches  
*Typical profile:*  
    A—0 to 8 inches; loam  
    Bw—8 to 15 inches; loam  
    Bk1—15 to 28 inches; loam  
    Bk2—28 to 38 inches; gravelly loam  
    C—38 to 60 inches; very gravelly sandy loam

**Anaconda and similar soils**

*Composition:* 20 percent  
*Geomorphic description:* Fan remnant  
*Slope:* 2 to 8 percent  
*Elevation:* 5,230 to 6,050 feet  
*Effective annual precipitation:* 12 to 14 inches  
*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Sandy loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Coarse-loamy alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Salt affected:* Saline within 30 inches  
*Available water capacity:* Mainly 7.4 inches  
*Typical profile:*  
    A—0 to 8 inches; sandy loam  
    Bw—8 to 14 inches; sandy loam  
    Bk1—14 to 27 inches; sandy loam  
    Bk2—27 to 60 inches; sandy loam

**Additional Components**

Anaconda, greater slopes and similar soils: 5 percent

**159E—Monaberg-Varney-Philipsburg complex, 8 to 35 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,610 to 6,400 feet  
*Mean annual precipitation:* 14 to 16 inches  
*Frost-free period:* 50 to 75 days

## Component Description

### **Monaberg and similar soils**

*Composition:* 35 percent

*Geomorphic description:*

- Backslope on hill
- Shoulder on hill

*Slope:* 15 to 35 percent, west to east aspects

*Elevation:* 5,610 to 6,400 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Granite alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 8.3 inches

*Typical profile:*

- A—0 to 10 inches; loam
- Bt—10 to 28 inches; gravelly sandy clay loam
- C—28 to 60 inches; gravelly sandy clay loam

### **Varney and similar soils**

*Composition:* 35 percent

*Geomorphic description:*

- Backslope on hill
- Shoulder on hill

*Slope:* 8 to 30 percent, east to northwest aspects

*Elevation:* 5,610 to 6,400 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 55 to 75 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 6.8 inches

*Typical profile:*

- A—0 to 7 inches; sandy loam
- Bt—7 to 18 inches; gravelly sandy clay loam
- Bk—18 to 48 inches; gravelly sandy loam
- C—48 to 60 inches; gravelly loamy coarse sand

### **Philipsburg and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Footslope on hill

*Slope:* 8 to 20 percent

*Elevation:* 5,610 to 6,400 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 9.2 inches

*Typical profile:*

A—0 to 9 inches; sandy loam

Bt—9 to 22 inches; clay loam

Bk1—22 to 40 inches; gravelly loam

Bk2—40 to 60 inches; gravelly loam

### **Additional Components**

Anaconda and similar soils: 9 percent

Riverwash: 1 percent

## **160E—Bridger-Patouza, stony-Varney complex, 8 to 45 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,480 to 6,180 feet

*Mean annual precipitation:* 12 to 16 inches

*Frost-free period:* 65 to 90 days

### **Component Description**

#### **Bridger and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Backslope on ravine escarpment

*Slope:* 15 to 45 percent, northwest to east aspects

*Elevation:* 5,480 to 6,180 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 65 to 80 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Tertiary volcanic alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 7.9 inches

*Typical profile:*

A1—0 to 3 inches; loam

A2—3 to 9 inches; loam

Bt—9 to 17 inches; clay

Bk—17 to 34 inches; loam

C—34 to 60 inches; sandy loam

#### **Patouza, stony, deep and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Backslope on ravine escarpment

*Slope:* 15 to 45 percent, east to northwest aspects

*Elevation:* 5,480 to 6,180 feet

*Effective annual precipitation:* 10 to 13 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Clay loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 30 to 100 feet apart

*Depth to restrictive feature:* Paralithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Clayey alluvium over tertiary residuum

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 8.5 inches

*Typical profile:*

A—0 to 7 inches; clay loam

Bt—7 to 19 inches; clay loam

Bk—19 to 41 inches; loam

BCk—41 to 57 inches; sandy clay loam

Cr—57 to 60 inches; bedrock

### **Varney and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Ravine escarpment

*Slope:* 8 to 15 percent

*Elevation:* 5,480 to 6,180 feet

*Effective annual precipitation:* 12 to 16 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Salt affected:* Saline within 30 inches

*Available water capacity:* Mainly 7.6 inches

*Typical profile:*

A—0 to 7 inches; loam

Bt—7 to 12 inches; gravelly clay loam

Bk—12 to 60 inches; gravelly sandy loam

### **Additional Components**

Ratiopeak, very stony and similar soils: 6 percent

Mannixlee and similar soils: 4 percent

## **161C—Philipsburg-Philipsburg, stony-Danielvil complex, 2 to 8 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,360 to 5,920 feet

*Mean annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Philipsburg and similar soils**

*Composition:* 45 percent

*Geomorphic description:* Fan remnant

*Slope:* 2 to 8 percent

*Elevation:* 5,360 to 5,920 feet



*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 9.2 inches

*Typical profile:*

A—0 to 9 inches; loam

Bt—9 to 22 inches; clay loam

Bk1—22 to 40 inches; gravelly loam

Bk2—40 to 60 inches; gravelly loam

**Philipsburg, stony and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Fan remnant

*Slope:* 2 to 4 percent

*Elevation:* 5,360 to 5,920 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 30 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 9.2 inches

*Typical profile:*

A—0 to 9 inches; loam

Bt—9 to 22 inches; clay loam

Bk1—22 to 40 inches; gravelly loam

Bk2—40 to 60 inches; gravelly loam

**Danielvil and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Fan remnant

*Slope:* 2 to 8 percent

*Elevation:* 5,360 to 5,920 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 6.9 inches

*Typical profile:*

A1—0 to 5 inches; loam

A2—5 to 13 inches; loam

Bw—13 to 23 inches; gravelly sandy loam

BC—23 to 34 inches; gravelly sandy loam

2C—34 to 60 inches; gravelly coarse sandy loam

#### **Additional Components**

Monaberg and similar soils: 10 percent

### **162B—Monaberg loam, 1 to 4 percent slopes**

#### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 6,230 to 6,410 feet

*Mean annual precipitation:* 20 to 24 inches

*Frost-free period:* 30 to 50 days

#### **Component Description**

##### **Monaberg, wet and similar soils**

*Composition:* 90 percent

*Geomorphic description:* Alluvial fan

*Slope:* 1 to 4 percent

*Elevation:* 6,230 to 6,410 feet

*Effective annual precipitation:* 20 to 24 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Moderately well drained

*Parent material:* Mixed volcanic or granite alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Water table:* Present

*Available water capacity:* Mainly 8.3 inches

*Typical profile:*

A—0 to 10 inches; loam

Bt—10 to 28 inches; gravelly sandy clay loam

C—28 to 60 inches; gravelly sandy clay loam

#### **Additional Components**

Bridger and similar soils: 5 percent

Kilgore and similar soils: 5 percent

### **164B—Danielvil loam, moist, 1 to 4 percent slopes**

#### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 6,230 to 6,450 feet

*Mean annual precipitation:* 19 to 24 inches

*Frost-free period:* 30 to 50 days

#### **Component Description**

##### **Danielvil, wet and similar soils**

*Composition:* 85 percent

*Geomorphic description:* Alluvial fan

*Slope:* 1 to 4 percent  
*Elevation:* 6,230 to 6,450 feet  
*Effective annual precipitation:* 19 to 24 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Moderately well drained  
*Parent material:* Coarse-loamy alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Water table:* Present  
*Available water capacity:* Mainly 6.9 inches  
*Typical profile:*  
A1—0 to 5 inches; loam  
A2—5 to 13 inches; loam  
Bw—13 to 23 inches; gravelly sandy loam  
BC—23 to 34 inches; gravelly sandy loam  
2C—34 to 60 inches; gravelly coarse sandy loam

#### **Additional Components**

Kilgore and similar soils: 10 percent  
Foxgulch and similar soils: 5 percent

### **165A—Mooseflat, rarely flooded-Foxgulch, very rarely flooded complex, 0 to 4 percent slopes**

#### **Map Unit Setting**

*Interpretive focus:* Riparian  
*Elevation:* 5,580 to 6,920 feet  
*Mean annual precipitation:* 14 to 19 inches  
*Frost-free period:* 30 to 70 days

#### **Component Description**

##### **Mooseflat and similar soils**

*Composition:* 60 percent  
*Geomorphic description:* Flood plain  
*Slope:* 0 to 2 percent  
*Elevation:* 5,580 to 6,920 feet  
*Effective annual precipitation:* 14 to 19 inches  
*Frost-free period:* 30 to 70 days  
*Surface layer texture:* Loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Very poorly drained  
*Parent material:* Alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* Rare  
*Water table:* Present  
*Available water capacity:* Mainly 4.1 inches  
*Typical profile:*  
Oi—0 to 2 inches; slightly decomposed plant material  
A—2 to 12 inches; loam  
Bg—12 to 18 inches; sandy loam

BCg—18 to 26 inches; very gravelly loamy sand

2Cg—26 to 60 inches; very cobbly loamy coarse sand

**Foxgulch and similar soils**

*Composition:* 25 percent

*Geomorphic description:* Flood-plain step

*Slope:* 1 to 4 percent

*Elevation:* 5,580 to 6,920 feet

*Effective annual precipitation:* 14 to 19 inches

*Frost-free period:* 30 to 70 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Somewhat poorly drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* Very rare

*Water table:* Present

*Available water capacity:* Mainly 7.8 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

A—1 to 12 inches; loam

Bw—12 to 30 inches; loam

BC—30 to 46 inches; sandy clay loam

2C—46 to 60 inches; very gravelly coarse sand

**Additional Components**

Kilgore and similar soils: 10 percent

Water: 5 percent

**166B—Kilgore-Foolhen-Monaberg complex, 0 to 4 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,640 to 6,450 feet

*Mean annual precipitation:* 20 to 24 inches

*Frost-free period:* 30 to 50 days

**Component Description**

**Kilgore and similar soils**

*Composition:* 40 percent

*Geomorphic description:* Wet swale

*Slope:* 0 to 2 percent

*Elevation:* 5,640 to 6,450 feet

*Effective annual precipitation:* 20 to 24 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Silty clay loam

*Depth to restrictive feature:* None noted

*Drainage class:* Poorly drained

*Parent material:* Mixed volcanic or granite alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Water table:* Present

*Available water capacity:* Mainly 6.4 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

A—2 to 19 inches; silty clay loam

Ag—19 to 29 inches; loam

2Cg—29 to 38 inches; gravelly sandy loam

2C—38 to 60 inches; very gravelly coarse sand

**Foolhen and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Wet swale

*Slope:* 1 to 4 percent

*Elevation:* 5,640 to 6,450 feet

*Effective annual precipitation:* 20 to 24 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Mucky silt loam

*Depth to restrictive feature:* None noted

*Drainage class:* Somewhat poorly drained

*Parent material:* Mixed volcanic or granite alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Water table:* Present

*Available water capacity:* Mainly 9.5 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

A—2 to 13 inches; mucky silt loam

Bw—13 to 26 inches; loam

C1—26 to 39 inches; sandy clay loam

C2—39 to 60 inches; sandy clay loam

**Monaberg, wet and similar soils**

*Composition:* 25 percent

*Geomorphic description:* Upper edges of wet swale

*Slope:* 1 to 4 percent

*Elevation:* 5,640 to 6,450 feet

*Effective annual precipitation:* 20 to 24 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Moderately well drained

*Parent material:* Mixed volcanic or granite alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Water table:* Present

*Available water capacity:* Mainly 8.3 inches

*Typical profile:*

A—0 to 10 inches; loam

Bt—10 to 28 inches; gravelly sandy clay loam

C—28 to 60 inches; gravelly sandy clay loam

## **167C—Monaberg loam, 2 to 8 percent slopes, stony**

### **Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 6,250 to 6,480 feet  
*Mean annual precipitation:* 19 to 24 inches  
*Frost-free period:* 30 to 50 days

### **Component Description**

#### **Monaberg, stony and similar soils**

*Composition:* 90 percent  
*Geomorphic description:* Alluvial fan  
*Slope:* 2 to 8 percent  
*Elevation:* 6,250 to 6,480 feet  
*Effective annual precipitation:* 19 to 24 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Loam  
*Rock fragments on the soil surface:* 0.00 to 0.10 percent stones, 40 to 100 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Loamy alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 8.3 inches  
*Typical profile:*  
    A—0 to 10 inches; loam  
    Bt—10 to 28 inches; gravelly sandy clay loam  
    C—28 to 60 inches; gravelly sandy clay loam

### **Additional Components**

Monaberg, wet and similar soils: 10 percent

## **168E—Sebud-Sieben complex, 8 to 30 percent slopes, stony**

### **Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,330 to 6,130 feet  
*Mean annual precipitation:* 14 to 16 inches  
*Frost-free period:* 65 to 90 days

### **Component Description**

#### **Sebud, stony and similar soils**

*Composition:* 50 percent  
*Geomorphic description:*

- Shoulder on hill
- Backslope on hill

*Slope:* 8 to 30 percent, west to southeast aspects  
*Elevation:* 5,330 to 6,140 feet  
*Effective annual precipitation:* 15 to 17 inches  
*Frost-free period:* 65 to 75 days

*Surface layer texture:* Cobbly loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 30 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Sandy and gravelly alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.8 inches

*Typical profile:*

A1—0 to 6 inches; cobbly loam

A2—6 to 12 inches; very cobbly loam

Bw—12 to 20 inches; very cobbly sandy loam

BC—20 to 30 inches; very cobbly sandy loam

C—30 to 60 inches; very gravelly sandy loam

### **Sieben, stony and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Backslope on hill

*Slope:* 15 to 30 percent, southeast to west aspects

*Elevation:* 5,330 to 6,140 feet

*Effective annual precipitation:* 12 to 15 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Very cobbly loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 30 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 4.2 inches

*Typical profile:*

A—0 to 5 inches; very cobbly loam

Bt—5 to 12 inches; very gravelly sandy clay loam

Bk1—12 to 25 inches; very gravelly sandy loam

Bk2—25 to 60 inches; very gravelly sandy loam

### **Additional Components**

Sixbeacon, stony and similar soils: 10 percent

Sieben, very stony and similar soils: 5 percent

Varney and similar soils: 5 percent

## **169E—Sebud-Sieben complex, 8 to 30 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,430 to 5,770 feet

*Mean annual precipitation:* 14 to 16 inches

*Frost-free period:* 65 to 90 days

## Component Description

### **Sebud and similar soils**

*Composition:* 45 percent

*Geomorphic description:*

- Shoulder on hill
- Backslope on hill

*Slope:* 8 to 30 percent, west to southeast aspects

*Elevation:* 5,430 to 5,770 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 65 to 75 days

*Surface layer texture:* Cobbly loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Sandy and gravelly alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.8 inches

*Typical profile:*

- A1—0 to 6 inches; cobbly loam
- A2—6 to 12 inches; very cobbly loam
- Bw—12 to 20 inches; very cobbly sandy loam
- BC—20 to 30 inches; very cobbly sandy loam
- C—30 to 60 inches; very gravelly sandy loam

### **Sieben and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Backslope on hill

*Slope:* 15 to 30 percent, southeast to west aspects

*Elevation:* 5,430 to 5,770 feet

*Effective annual precipitation:* 12 to 15 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Very cobbly loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 4.2 inches

*Typical profile:*

- A—0 to 5 inches; very cobbly loam
- Bt—5 to 12 inches; very gravelly sandy clay loam
- Bk1—12 to 25 inches; very gravelly sandy loam
- Bk2—25 to 60 inches; very gravelly sandy loam

## Additional Components

Sieben, greater slopes and similar soils: 10 percent

Sixbeacon and similar soils: 7 percent

Varney and similar soils: 3 percent



## **170E—Ratiopeak, very stony-Bridger-Adel complex, 8 to 30 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,430 to 5,770 feet

*Mean annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Ratiopeak, very stony and similar soils**

*Composition:* 45 percent

*Geomorphic description:*

- Backslope on hill
- Shoulder on hill

*Slope:* 12 to 30 percent

*Elevation:* 5,430 to 5,770 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Cobbly loam

*Rock fragments on the soil surface:* 0.10 to 2.00 percent stones, 7 to 30 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium derived from quartzite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 6.3 inches

*Typical profile:*

A—0 to 8 inches; cobbly loam

Bt—8 to 15 inches; very gravelly sandy clay loam

Bk1—15 to 24 inches; very gravelly loam

Bk2—24 to 45 inches; very cobbly loam

BC—45 to 60 inches; very gravelly coarse sandy loam

#### **Bridger and similar soils**

*Composition:* 30 percent

*Geomorphic description:*

- Footslope on hill
- Backslope on hill
- Low ridge

*Slope:* 8 to 15 percent

*Elevation:* 5,430 to 5,770 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Tertiary volcanic clayey alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 7.9 inches

*Typical profile:*

- A1—0 to 3 inches; loam
- A2—3 to 9 inches; loam
- Bt—9 to 17 inches; clay
- Bk—17 to 34 inches; loam
- C—34 to 60 inches; sandy loam

**Adel and similar soils**

*Composition:* 15 percent

*Geomorphic description:*

- Head slope on hill
- Swale

*Slope:* 8 to 25 percent

*Elevation:* 5,430 to 5,770 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 9.4 inches

*Typical profile:*

- A1—0 to 9 inches; loam
- A2—9 to 18 inches; loam
- Bw—18 to 28 inches; gravelly loam
- C—28 to 60 inches; gravelly loam

**Additional Components**

Redchief and similar soils: 7 percent

Ratiopeak, very stony, greater slopes and similar soils: 3 percent

**171D—Varney-Sieben, stony complex, 4 to 15 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,200 to 5,950 feet

*Mean annual precipitation:* 10 to 14 inches

*Frost-free period:* 70 to 90 days

**Component Description**

**Varney and similar soils**

*Composition:* 50 percent

*Geomorphic description:*

- Backslope on hill
- Footslope on hill
- Swale

*Slope:* 4 to 12 percent

*Elevation:* 5,200 to 5,950 feet

*Effective annual precipitation:* 10 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Cobbly sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Salt affected:* Saline within 30 inches

*Available water capacity:* Mainly 7.6 inches

*Typical profile:*

A—0 to 7 inches; cobbly sandy loam

Bt—7 to 12 inches; gravelly clay loam

Bk—12 to 60 inches; gravelly sandy loam

### **Sieben, stony and similar soils**

*Composition:* 30 percent

*Geomorphic description:*

- Backslope on south-facing hill
- Shoulder on south-facing hill

*Slope:* 6 to 15 percent, east to northwest aspects

*Elevation:* 5,200 to 5,950 feet

*Effective annual precipitation:* 10 to 13 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Very cobbly loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 30 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 4.2 inches

*Typical profile:*

A—0 to 5 inches; very cobbly loam

Bt—5 to 12 inches; very gravelly sandy clay loam

Bk1—12 to 25 inches; very gravelly sandy loam

Bk2—25 to 60 inches; very gravelly sandy loam

### **Additional Components**

Sieben, very stony and similar soils: 12 percent

Sieben, greater slopes and similar soils: 8 percent

## **172F—Ratiopeak-Sixbeacon-Tiban complex, 15 to 45 percent slopes, extremely stony**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,200 to 6,330 feet

*Mean annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 75 days

## Component Description

### **Ratiopeak, extremely stony and similar soils**

*Composition:* 35 percent

*Geomorphic description:*

- Backslope on south-facing hill
- Shoulder on south-facing hill

*Slope:* 15 to 40 percent, west to southeast aspects

*Elevation:* 5,200 to 6,330 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Cobbly loam

*Rock fragments on the soil surface:* 3 to 15 percent stones, 3 to 10 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium derived from quartzite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 6.3 inches

*Typical profile:*

- A—0 to 8 inches; cobbly loam
- Bt—8 to 15 inches; very gravelly sandy clay loam
- Bk1—15 to 24 inches; very gravelly loam
- Bk2—24 to 45 inches; very cobbly loam
- BC—45 to 60 inches; very gravelly coarse sandy loam

### **Sixbeacon, extremely stony and similar soils**

*Composition:* 35 percent

*Geomorphic description:*

- Shoulder on south-facing hill
- Backslope on south-facing hill

*Slope:* 20 to 45 percent, southeast to west aspects

*Elevation:* 5,200 to 6,330 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 65 to 75 days

*Surface layer texture:* Cobbly loam

*Rock fragments on the soil surface:* 3 to 15 percent stones, 3 to 10 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 4.9 inches

*Typical profile:*

- A—0 to 6 inches; cobbly loam
- Bw—6 to 12 inches; very cobbly loam
- Bk1—12 to 35 inches; very gravelly loam
- Bk2—35 to 60 inches; very gravelly sandy loam

### **Tiban, extremely stony and similar soils**

*Composition:* 15 percent

*Geomorphic description:*

- Nose slope on north-facing hill
- Ridge

*Slope:* 20 to 35 percent

*Elevation:* 5,200 to 6,330 feet  
*Effective annual precipitation:* 14 to 16 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Very cobbly loam  
*Rock fragments on the soil surface:* 3 to 15 percent stones, 3 to 10 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 5.6 inches  
*Typical profile:*  
    A—0 to 8 inches; very cobbly loam  
    Bw—8 to 16 inches; very cobbly loam  
    Bk—16 to 60 inches; very gravelly loam

#### **Additional Components**

Sebud, very stony and similar soils: 10 percent  
Sixbeacon, rubbly and similar soils: 5 percent

### **173B—Monaberg-Foolhen complex, 1 to 6 percent slopes**

#### **Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,640 to 5,870 feet  
*Mean annual precipitation:* 12 to 16 inches  
*Frost-free period:* 50 to 70 days

#### **Component Description**

##### **Monaberg, wet and similar soils**

*Composition:* 70 percent  
*Geomorphic description:* Stream terrace  
*Slope:* 1 to 6 percent  
*Elevation:* 5,640 to 5,870 feet  
*Effective annual precipitation:* 12 to 16 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Moderately well drained  
*Parent material:* Alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Water table:* Present  
*Available water capacity:* Mainly 8.3 inches  
*Typical profile:*  
    A—0 to 10 inches; loam  
    Bt—10 to 28 inches; gravelly sandy clay loam  
    C—28 to 60 inches; gravelly sandy clay loam

##### **Foolhen and similar soils**

*Composition:* 15 percent  
*Geomorphic description:* Stream terrace  
*Slope:* 1 to 4 percent

*Elevation:* 5,640 to 5,870 feet  
*Effective annual precipitation:* 12 to 16 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Somewhat poorly drained  
*Parent material:* Alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Water table:* Present  
*Available water capacity:* Mainly 9.5 inches  
*Typical profile:*  
    Oi—0 to 2 inches; slightly decomposed plant material  
    A—2 to 13 inches; loam  
    Bw—13 to 26 inches; loam  
    C1—26 to 39 inches; sandy clay loam  
    C2—39 to 60 inches; sandy clay loam

#### **Additional Components**

Kilgore and similar soils: 10 percent  
Monaberg and similar soils: 5 percent

### **174C—Philipsburg loam, 2 to 8 percent slopes**

#### **Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,480 to 6,230 feet  
*Mean annual precipitation:* 12 to 16 inches  
*Frost-free period:* 50 to 70 days

#### **Component Description**

##### **Philipsburg and similar soils**

*Composition:* 85 percent  
*Geomorphic description:* Alluvial fan  
*Slope:* 2 to 8 percent  
*Elevation:* 5,480 to 6,230 feet  
*Effective annual precipitation:* 12 to 16 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Loamy alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 9.2 inches  
*Typical profile:*  
    A—0 to 9 inches; loam  
    Bt—9 to 22 inches; clay loam  
    Bk—22 to 40 inches; gravelly loam  
    BC—40 to 44 inches; gravelly loam  
    C—44 to 60 inches; gravelly loam

### **Additional Components**

Danielvil and similar soils: 8 percent  
Bearmouth and similar soils: 5 percent  
Sebud, very stony and similar soils: 2 percent

## **175B—Foolhen-Kilgore complex, 0 to 4 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Riparian  
*Elevation:* 6,230 to 6,450 feet  
*Mean annual precipitation:* 19 to 24 inches  
*Frost-free period:* 30 to 50 days

### **Component Description**

#### **Foolhen and similar soils**

*Composition:* 50 percent  
*Geomorphic description:* Drainageway  
*Slope:* 0 to 4 percent  
*Elevation:* 6,230 to 6,450 feet  
*Effective annual precipitation:* 19 to 24 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Somewhat poorly drained  
*Parent material:* Alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Water table:* Present  
*Available water capacity:* Mainly 9.5 inches  
*Typical profile:*  
    Oi—0 to 2 inches; slightly decomposed plant material  
    A—2 to 13 inches; loam  
    Bw—13 to 26 inches; loam  
    C1—26 to 39 inches; sandy clay loam  
    C2—39 to 60 inches; sandy clay loam

#### **Kilgore and similar soils**

*Composition:* 40 percent  
*Geomorphic description:* Drainageway  
*Slope:* 0 to 4 percent  
*Elevation:* 6,230 to 6,450 feet  
*Effective annual precipitation:* 19 to 24 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Silt loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Poorly drained  
*Parent material:* Alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Water table:* Present  
*Available water capacity:* Mainly 6.4 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material  
A—2 to 19 inches; silt loam  
Ag—19 to 29 inches; loam  
2Cg—29 to 38 inches; gravelly sandy loam  
2C—38 to 60 inches; very gravelly coarse sand

**Additional Components**

Philipsburg, wet and similar soils: 10 percent

**177C—Udecide-Gnojek, stony complex, 2 to 8 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,640 to 6,020 feet  
*Mean annual precipitation:* 10 to 14 inches  
*Frost-free period:* 70 to 90 days

**Component Description**

**Udecide and similar soils**

*Composition:* 65 percent  
*Geomorphic description:* Strath terrace  
*Slope:* 2 to 8 percent  
*Elevation:* 5,640 to 6,020 feet  
*Effective annual precipitation:* 10 to 14 inches  
*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Sandy loam  
*Depth to restrictive feature:* Paralithic bedrock: 25 to 40 inches  
*Drainage class:* Well drained  
*Parent material:* Loamy alluvium over tertiary residuum  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 4.5 inches  
*Typical profile:*  
A—0 to 9 inches; sandy loam  
Bt—9 to 17 inches; sandy clay loam  
Bk—17 to 33 inches; sandy loam  
BC—33 to 36 inches; gravelly sandy loam  
Cr—36 to 60 inches; bedrock

**Gnojek, stony and similar soils**

*Composition:* 25 percent  
*Geomorphic description:* Strath terrace  
*Slope:* 4 to 8 percent  
*Elevation:* 5,640 to 6,020 feet  
*Effective annual precipitation:* 10 to 14 inches  
*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Channery sandy loam  
*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart  
*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches  
*Drainage class:* Well drained



*Parent material:* Tertiary volcanic residuum

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.2 inches

*Typical profile:*

A—0 to 3 inches; channery sandy loam

Bt—3 to 10 inches; very channery sandy clay loam

Bk—10 to 15 inches; very channery sandy loam

R—15 to 60 inches; bedrock

### **Additional Components**

Udecide, deep and similar soils: 10 percent

## **178E—Rootel-Varney complex, 8 to 30 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,450 to 5,950 feet

*Mean annual precipitation:* 10 to 12 inches

*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Rootel and similar soils**

*Composition:* 45 percent

*Geomorphic description:*

- Shoulder on hill
- Backslope on hill

*Slope:* 15 to 30 percent

*Elevation:* 5,450 to 5,950 feet

*Effective annual precipitation:* 10 to 12 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Very cobbly loam

*Depth to restrictive feature:* Lithic bedrock: 20 to 40 inches

*Drainage class:* Well drained

*Parent material:* Fine-loamy residuum weathered from sandstone and shale

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 4.5 inches

*Typical profile:*

A—0 to 3 inches; very cobbly loam

Bk—3 to 28 inches; channery loam

R—28 to 60 inches; unweathered bedrock

#### **Varney and similar soils**

*Composition:* 40 percent

*Geomorphic description:*

- Head slope toeslope on hill
- Head slope footslope on hill

*Slope:* 8 to 15 percent

*Elevation:* 5,450 to 5,950 feet

*Effective annual precipitation:* 10 to 12 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Fine-loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Salt affected:* Saline within 30 inches

*Available water capacity:* Mainly 7.6 inches

*Typical profile:*

A—0 to 7 inches; loam

Bt—7 to 12 inches; gravelly clay loam

Bk—12 to 60 inches; gravelly sandy loam

### **Additional Components**

Gnojek and similar soils: 10 percent

Rootel, moist and similar soils: 5 percent

## **179F—Vendome, extremely stony-Sixbeacon complex, 25 to 60 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,220 to 5,580 feet

*Mean annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Vendome, extremely stony and similar soils**

*Composition:* 45 percent

*Geomorphic description:* Backslope on escarpment

*Slope:* 30 to 60 percent, east to northwest aspects

*Elevation:* 5,220 to 5,580 feet

*Effective annual precipitation:* 10 to 12 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Very cobbly loam

*Rock fragments on the soil surface:* 3 to 15 percent stones, 2 to 10 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Sandy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.9 inches

*Typical profile:*

A—0 to 11 inches; very cobbly loam

Bk1—11 to 24 inches; very cobbly sandy loam

2Bk2—24 to 60 inches; very cobbly coarse sand

#### **Sixbeacon and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Footslope on escarpment

*Slope:* 25 to 45 percent

*Elevation:* 5,220 to 5,580 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Cobbly loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 4.9 inches  
*Typical profile:*  
A—0 to 6 inches; cobbly loam  
Bw—6 to 12 inches; very cobbly loam  
Bk1—12 to 35 inches; very gravelly loam  
Bk2—35 to 60 inches; very gravelly sandy loam

#### **Additional Components**

Sixbeacon, lesser slopes and similar soils: 10 percent  
Vendome and similar soils: 10 percent  
Vendome, extremely bouldery, lesser slopes and similar soils: 5 percent

### **182C—Varney, stony-Anamac, very stony-Rivra, extremely stony complex, 2 to 8 percent slopes**

#### **Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,200 to 5,650 feet  
*Mean annual precipitation:* 10 to 14 inches  
*Frost-free period:* 70 to 90 days

#### **Component Description**

##### **Varney, stony and similar soils**

*Composition:* 45 percent  
*Geomorphic description:* Footslope on alluvial fan  
*Slope:* 2 to 4 percent  
*Elevation:* 5,200 to 5,650 feet  
*Effective annual precipitation:* 10 to 14 inches  
*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Sandy loam  
*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Loamy alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 6.8 inches  
*Typical profile:*  
A—0 to 7 inches; sandy loam  
Bt—7 to 18 inches; gravelly sandy clay loam  
Bk—18 to 48 inches; gravelly sandy loam  
C—48 to 60 inches; gravelly loamy coarse sand

##### **Anamac, very stony and similar soils**

*Composition:* 25 percent  
*Geomorphic description:* Footslope on low hill

*Slope:* 4 to 8 percent

*Elevation:* 5,200 to 5,650 feet

*Effective annual precipitation:* 10 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Loam

*Rock fragments on the soil surface:* 0.10 to 2.00 percent stones, 17 to 30 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 7.0 inches

*Typical profile:*

A—0 to 8 inches; loam

Bw—8 to 15 inches; loam

Bk1—15 to 28 inches; loam

Bk2—28 to 38 inches; gravelly loam

C—38 to 60 inches; very gravelly sandy loam

### **Rivra, extremely stony and similar soils**

*Composition:* 25 percent

*Geomorphic description:* High-energy drainageway

*Slope:* 2 to 8 percent

*Elevation:* 5,200 to 5,650 feet

*Effective annual precipitation:* 10 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Very cobbly sandy loam

*Rock fragments on the soil surface:* 3 to 7 percent stones, 5 to 10 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Sandy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.1 inches

*Typical profile:*

A—0 to 8 inches; very cobbly sandy loam

C1—8 to 43 inches; gravelly loamy coarse sand

C2—43 to 60 inches; gravelly coarse sand

### **Additional Components**

Vendome and similar soils: 3 percent

Riverwash: 2 percent

## **183B—Anamac-Varney complex, 1 to 6 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,380 to 5,460 feet

*Mean annual precipitation:* 10 to 14 inches

*Frost-free period:* 70 to 90 days

## Component Description

### **Anamac and similar soils**

*Composition:* 65 percent

*Geomorphic description:* Tread backslope on alluvial fan

*Slope:* 1 to 6 percent

*Elevation:* 5,380 to 5,460 feet

*Effective annual precipitation:* 10 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Clay loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 7.0 inches

*Typical profile:*

A—0 to 8 inches; clay loam

Bw—8 to 15 inches; loam

Bk1—15 to 28 inches; loam

Bk2—28 to 38 inches; gravelly loam

C—38 to 60 inches; very gravelly sandy loam

### **Varney and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Tread backslope on alluvial fan

*Slope:* 1 to 4 percent

*Elevation:* 5,380 to 5,460 feet

*Effective annual precipitation:* 10 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Clay loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 7.3 inches

*Typical profile:*

A—0 to 9 inches; clay loam

Bt—9 to 25 inches; sandy clay loam

BC—25 to 44 inches; gravelly sandy loam

C—44 to 60 inches; gravelly loamy coarse sand

## Additional Components

Work, stony and similar soils: 5 percent

## **235B—Anaconda sandy loam, 0 to 4 percent slopes, severely impacted**

### Map Unit Setting

*Interpretive focus:* Rangeland

*Elevation:* 4,760 to 5,490 feet

*Mean annual precipitation:* 10 to 14 inches

*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Anaconda, severely impacted and similar soils**

*Composition:* 90 percent

*Geomorphic description:*

- Alluvial fan
- Stream terrace

*Slope:* 0 to 4 percent

*Elevation:* 4,760 to 5,500 feet

*Effective annual precipitation:* 10 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Coarse-loamy alluvium

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 7.0 inches

*Typical profile:*

A1—0 to 0 inches; sandy loam

A2—0 to 8 inches; sandy loam

Bw—8 to 17 inches; sandy loam

Bk—17 to 36 inches; coarse sandy loam

BC—36 to 60 inches; loamy sand

### **Additional Components**

Rockerjohn, severely impacted and similar soils: 10 percent

## **272F—Rencot, stony-Spudbar-Rock outcrop complex, 25 to 50 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,000 to 6,580 feet

*Mean annual precipitation:* 10 to 14 inches

*Frost-free period:* 90 to 105 days

### **Component Description**

#### **Rencot, stony and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Hill

*Slope:* 25 to 50 percent

*Elevation:* 5,000 to 6,580 feet

*Effective annual precipitation:* 10 to 14 inches

*Frost-free period:* 90 to 105 days

*Surface layer texture:* Very cobbly loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Well drained

*Parent material:*

- Residuum weathered from rhyolite
- Colluvium derived from rhyolite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.4 inches

*Typical profile:*

- A—0 to 3 inches; very cobbly loam
- Bk1—3 to 9 inches; very gravelly loam
- Bk2—9 to 15 inches; extremely gravelly sandy loam
- R—15 to 60 inches; unweathered bedrock

**Spudbar and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Hill

*Slope:* 25 to 50 percent

*Elevation:* 5,000 to 6,580 feet

*Effective annual precipitation:* 10 to 14 inches

*Frost-free period:* 90 to 105 days

*Surface layer texture:* Very cobbly loam

*Depth to restrictive feature:* Lithic bedrock: 20 to 40 inches

*Drainage class:* Well drained

*Parent material:* Residuum weathered from sandstone and shale and/or residuum weathered from siltstone

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.9 inches

*Typical profile:*

- A—0 to 6 inches; very cobbly loam
- Bk1—6 to 18 inches; very gravelly loam
- Bk2—18 to 22 inches; extremely gravelly sandy loam
- R—22 to 60 inches; unweathered bedrock

**Rock outcrop**

*Composition:* 15 percent

**Additional Components**

Rubble land: 10 percent

Spudbar, lesser slopes and similar soils: 10 percent

Rencot, very stony and similar soils: 9 percent

Zbart and similar soils: 6 percent

**301E—Philipsburg-Beeftrail, bouldery-Danielvil complex,  
8 to 30 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,760 to 6,170 feet

*Mean annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

## Component Description

### Philipsburg and similar soils

*Composition:* 40 percent

*Geomorphic description:* Backslope on hill

*Slope:* 8 to 30 percent

*Elevation:* 5,760 to 6,170 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Mixed volcanic or granite alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 9.2 inches

*Typical profile:*

A—0 to 9 inches; sandy loam

Bt—9 to 22 inches; clay loam

Bk1—22 to 40 inches; gravelly loam

Bk2—40 to 60 inches; gravelly loam

### Beeftrail, bouldery and similar soils

*Composition:* 35 percent

*Geomorphic description:*

- Shoulder on ridge
- Summit on ridge
- Backslope on ridge

*Slope:* 8 to 25 percent

*Elevation:* 5,760 to 6,170 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Coarse sandy loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent boulders, 40 to 100 feet apart

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 28 to 56 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 2.2 inches

*Typical profile:*

A—0 to 7 inches; coarse sandy loam

Bw—7 to 14 inches; gravelly coarse sandy loam

BC—14 to 26 inches; gravelly loamy coarse sand

Cr—26 to 35 inches; bedrock

R—35 to 45 inches; bedrock

### Danielvil and similar soils

*Composition:* 25 percent

*Geomorphic description:*

- Backslope on north-facing hill
- Footslope on north-facing hill
- Swale



*Slope:* 8 to 25 percent, west to southeast aspects

*Elevation:* 5,760 to 6,170 feet

*Effective annual precipitation:* 17 to 20 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 6.9 inches

*Typical profile:*

A1—0 to 5 inches; sandy loam

A2—5 to 13 inches; loam

Bw—13 to 23 inches; gravelly sandy loam

BC—23 to 34 inches; gravelly sandy loam

2C—34 to 60 inches; gravelly coarse sandy loam

### **303D—Moosejaw, occasionally flooded-Highrye-Silas, occasionally flooded complex, 2 to 12 percent slopes**

#### **Map Unit Setting**

*Interpretive focus:* Riparian

*Elevation:* 5,360 to 6,770 feet

*Mean annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

#### **Component Description**

##### **Moosejaw and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Flood plain

*Slope:* 2 to 4 percent

*Elevation:* 5,360 to 6,770 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Mucky peat

*Depth to restrictive feature:* None noted

*Drainage class:* Very poorly drained

*Parent material:* Mixed alluvium over alluvium derived from granite

*Native plant cover type:* Rangeland

*Flooding:* Occasional

*Water table:* Present

*Available water capacity:* Mainly 7.9 inches

*Typical profile:*

Oe—0 to 4 inches; mucky peat

A—4 to 22 inches; loam

Cg—22 to 48 inches; sandy loam

2Cg—48 to 72 inches; very gravelly coarse sand

##### **Highrye and similar soils**

*Composition:* 25 percent

*Geomorphic description:* Side slope on swales and depositional areas

*Slope:* 4 to 12 percent

*Elevation:* 5,360 to 6,770 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly sandy clay loam

*Depth to restrictive feature:* Paralithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Colluvium derived from granite over residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.3 inches

*Typical profile:*

A—0 to 11 inches; gravelly sandy clay loam

Bt—11 to 32 inches; gravelly sandy clay loam

BC—32 to 46 inches; gravelly coarse sandy loam

C—46 to 56 inches; very gravelly coarse sand

Cr—56 to 60 inches; bedrock

#### **Silas and similar soils**

*Composition:* 20 percent

*Geomorphic description:*

- Toeslope on hill
- Stream terrace

*Slope:* 2 to 8 percent

*Elevation:* 5,360 to 6,770 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Moderately well drained

*Parent material:* Mixed alluvium

*Native plant cover type:* Forestland

*Flooding:* Occasional

*Water table:* Present

*Available water capacity:* Mainly 11.2 inches

*Typical profile:*

Oe—0 to 2 inches; moderately decomposed plant material

A1—1 to 18 inches; loam

A2—18 to 38 inches; loam

C—38 to 72 inches; loam

#### **Additional Components**

Branham, bouldery and similar soils: 10 percent

Zonite and similar soils: 9 percent

Rock outcrop: 1 percent

### **305D—Beeftrail-Branham-Minestope complex, 2 to 15 percent slopes**

#### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,230 to 7,570 feet

*Mean annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

## Component Description

### **Beeftrail and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Side slope on hill

*Slope:* 8 to 15 percent

*Elevation:* 5,230 to 7,570 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Coarse sandy loam

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 28 to 56 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 2.2 inches

*Typical profile:*

- A—0 to 7 inches; coarse sandy loam
- Bw—7 to 14 inches; gravelly coarse sandy loam
- BC—14 to 26 inches; gravelly loamy coarse sand
- Cr—26 to 35 inches; bedrock
- R—35 to 45 inches; bedrock

### **Branham and similar soils**

*Composition:* 25 percent

*Geomorphic description:* Interfluvium on hill

*Slope:* 4 to 8 percent

*Elevation:* 5,230 to 7,570 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 24 to 56 inches

*Drainage class:* Well drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.1 inches

*Typical profile:*

- A—0 to 7 inches; sandy loam
- Bw—7 to 17 inches; gravelly coarse sandy loam
- BC—17 to 26 inches; gravelly coarse sandy loam
- Cr—26 to 34 inches; bedrock
- R—34 to 44 inches; bedrock

### **Minestope and similar soils**

*Composition:* 25 percent

*Geomorphic description:* Interfluvium on hill

*Slope:* 2 to 8 percent

*Elevation:* 5,230 to 7,570 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Coarse sandy loam

*Depth to restrictive feature:*

- Paralithic bedrock: 10 to 20 inches
- Lithic bedrock: 20 to 40 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 1.3 inches

*Typical profile:*

A—0 to 6 inches; coarse sandy loam

Bw—6 to 11 inches; gravelly coarse sandy loam

BC—11 to 17 inches; very gravelly loamy coarse sand

Cr—17 to 26 inches; bedrock

R—26 to 36 inches; bedrock

### **Additional Components**

Minestope, gravelly coarse sandy loam and similar soils: 10 percent

Highrye and similar soils: 8 percent

Rock outcrop: 2 percent

## **306E—Wissikihon-Branham-Highrye complex, 8 to 30 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,150 to 6,690 feet

*Mean annual precipitation:* 13 to 17 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Wissikihon and similar soils**

*Composition:* 45 percent

*Geomorphic description:* Side slope on hill

*Slope:* 8 to 30 percent

*Elevation:* 5,150 to 6,690 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Coarse sandy loam

*Depth to restrictive feature:* Paralithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Colluvium derived from granite over residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.0 inches

*Typical profile:*

A—0 to 8 inches; coarse sandy loam

Bw—8 to 16 inches; gravelly coarse sandy loam

BC—16 to 48 inches; gravelly loamy coarse sand

Cr—48 to 60 inches; bedrock

**Branham and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Side slope on hill

*Slope:* 15 to 30 percent

*Elevation:* 5,150 to 6,690 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Coarse sandy loam

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 24 to 56 inches

*Drainage class:* Well drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.1 inches

*Typical profile:*

A—0 to 7 inches; coarse sandy loam

Bw—7 to 17 inches; gravelly coarse sandy loam

BC—17 to 26 inches; gravelly coarse sandy loam

Cr—26 to 34 inches; bedrock

R—34 to 44 inches; bedrock

**Highrye and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Base slope on hill

*Slope:* 8 to 30 percent

*Elevation:* 5,150 to 6,690 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:* Paralithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Colluvium derived from granite over residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.3 inches

*Typical profile:*

A—0 to 11 inches; sandy loam

Bt—11 to 32 inches; gravelly sandy clay loam

BC—32 to 46 inches; gravelly coarse sandy loam

C—46 to 56 inches; very gravelly coarse sand

Cr—56 to 60 inches; bedrock

**Additional Components**

Oro Fino and similar soils: 11 percent

Zonite and similar soils: 3 percent

Rock outcrop: 1 percent

## **312D—Oro Fino-Highrye-Branham complex, 4 to 15 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland  
*Field investigation intensity:* Order 2  
*Elevation:* 5,410 to 6,580 feet  
*Mean annual precipitation:* 14 to 16 inches  
*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Oro Fino and similar soils**

*Composition:* 35 percent  
*Geomorphic description:* Base slope on hill  
*Slope:* 4 to 8 percent  
*Elevation:* 5,410 to 6,580 feet  
*Effective annual precipitation:* 14 to 16 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Coarse sandy loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Local alluvium derived from granite and/or colluvium derived from granite  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 8.4 inches  
*Typical profile:*  
    A—0 to 6 inches; coarse sandy loam  
    Bt—6 to 20 inches; gravelly sandy clay loam  
    Bk—20 to 38 inches; loam  
    C—38 to 60 inches; sandy loam

#### **Highrye and similar soils**

*Composition:* 30 percent  
*Geomorphic description:* Side slope on hill  
*Slope:* 4 to 15 percent  
*Elevation:* 5,410 to 6,580 feet  
*Effective annual precipitation:* 14 to 16 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Coarse sandy loam  
*Depth to restrictive feature:* Paralithic bedrock: 40 to 60 inches  
*Drainage class:* Well drained  
*Parent material:* Colluvium derived from granite over residuum weathered from granite  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 5.3 inches  
*Typical profile:*  
    A—0 to 11 inches; coarse sandy loam  
    Bt—11 to 32 inches; gravelly sandy clay loam  
    BC—32 to 46 inches; gravelly coarse sandy loam  
    C—46 to 56 inches; very gravelly coarse sand  
    Cr—56 to 60 inches; bedrock

**Branham and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Nose slope on hill

*Slope:* 4 to 15 percent

*Elevation:* 5,410 to 6,580 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Coarse sandy loam

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 24 to 56 inches

*Drainage class:* Well drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.1 inches

*Typical profile:*

A—0 to 7 inches; coarse sandy loam

Bw—7 to 17 inches; gravelly coarse sandy loam

BC—17 to 26 inches; gravelly coarse sandy loam

Cr—26 to 34 inches; bedrock

R—34 to 44 inches; bedrock

**Additional Components**

Oro Fino, greater slopes and similar soils: 10 percent

Minestope and similar soils: 4 percent

Rock outcrop: 1 percent

**313E—Beeftrail-Dinnen-Highrye complex, 8 to 45 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,430 to 7,530 feet

*Mean annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

**Component Description**

**Beeftrail and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Side slope on south-tending hill

*Slope:* 15 to 45 percent, east to northwest aspects

*Elevation:* 5,430 to 7,530 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly coarse sandy loam

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 28 to 56 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 2.1 inches

*Typical profile:*

- A—0 to 7 inches; gravelly coarse sandy loam
- Bw—7 to 14 inches; gravelly coarse sandy loam
- BC—14 to 26 inches; gravelly loamy coarse sand
- Cr—26 to 35 inches; bedrock
- R—35 to 60 inches; bedrock

#### **Dinnen and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Side slope on south-tending hill

*Slope:* 15 to 35 percent, east to northwest aspects

*Elevation:* 5,430 to 7,530 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Coarse sandy loam

*Depth to restrictive feature:* Paralithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Colluvium derived from granite over residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 6.4 inches

*Typical profile:*

- A—0 to 9 inches; coarse sandy loam
- Bw—9 to 21 inches; gravelly coarse sandy loam
- BC—21 to 41 inches; gravelly coarse sandy loam
- C—41 to 53 inches; gravelly loamy coarse sand
- Cr—53 to 60 inches; bedrock

#### **Highrye and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Side slope on north-tending hill

*Slope:* 15 to 45 percent, northwest to east aspects

*Elevation:* 5,430 to 7,530 feet

*Effective annual precipitation:* 17 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Coarse sandy loam

*Depth to restrictive feature:* Paralithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Colluvium derived from granite over residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.3 inches

*Typical profile:*

- A—0 to 11 inches; coarse sandy loam
- Bt—11 to 32 inches; gravelly sandy clay loam
- BC—32 to 46 inches; gravelly coarse sandy loam
- C—46 to 56 inches; very gravelly coarse sand
- Cr—56 to 60 inches; bedrock

#### **Dinnen, loam and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Base slope on hill



*Slope:* 8 to 25 percent  
*Elevation:* 5,430 to 7,530 feet  
*Effective annual precipitation:* 15 to 17 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Loam  
*Depth to restrictive feature:* Paralithic bedrock: 40 to 60 inches  
*Drainage class:* Well drained  
*Parent material:* Colluvium derived from granite over residuum weathered from granite  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 6.6 inches  
*Typical profile:*  
    A—0 to 9 inches; loam  
    Bw—9 to 21 inches; gravelly coarse sandy loam  
    BC—21 to 41 inches; gravelly coarse sandy loam  
    C—41 to 53 inches; gravelly loamy coarse sand  
    Cr—53 to 60 inches; bedrock

#### **Additional Components**

Fleecer and similar soils: 5 percent  
Zonite and similar soils: 5 percent  
Rock outcrop: 3 percent  
Bavdark and similar soils: 2 percent

### **314F—Basincreek-Comad complex, 20 to 50 percent slopes**

#### **Map Unit Setting**

*Interpretive focus:* Forestland  
*Elevation:* 5,680 to 7,230 feet  
*Mean annual precipitation:* 15 to 19 inches  
*Frost-free period:* 30 to 50 days

#### **Component Description**

##### **Basincreek and similar soils**

*Composition:* 60 percent  
*Geomorphic description:* Side slope on mountain  
*Slope:* 20 to 50 percent, west to east aspects  
*Elevation:* 5,680 to 7,230 feet  
*Effective annual precipitation:* 18 to 21 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Gravelly coarse sandy loam  
*Depth to restrictive feature:* Lithic bedrock: 40 to 60 inches  
*Drainage class:* Well drained  
*Parent material:* Colluvium derived from granite over residuum weathered from granite  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 3.7 inches  
*Typical profile:*  
    Oi—0 to 2 inches; slightly decomposed plant material  
    E—2 to 18 inches; gravelly coarse sandy loam  
    E and Bw—18 to 38 inches; gravelly coarse sandy loam

BC—38 to 46 inches; very gravelly sand

R—46 to 60 inches; bedrock

**Comad and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Head slope on mountain

*Slope:* 20 to 50 percent, west to east aspects

*Elevation:* 5,680 to 7,230 feet

*Effective annual precipitation:* 18 to 21 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Gravelly loamy coarse sand

*Depth to restrictive feature:* None noted

*Drainage class:* Excessively drained

*Parent material:* Colluvium derived from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 2.3 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

E—2 to 8 inches; gravelly loamy coarse sand

E and Bt—8 to 26 inches; very gravelly loamy coarse sand

C—26 to 60 inches; very gravelly coarse sand

**Additional Components**

Rock outcrop: 5 percent

Zonite and similar soils: 5 percent

**315F—Stecum-Hiore complex, 20 to 50 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,280 to 7,500 feet

*Mean annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

**Component Description**

**Stecum and similar soils**

*Composition:* 50 percent

*Geomorphic description:* Side slope on hill

*Slope:* 20 to 50 percent, west to east aspects

*Elevation:* 5,280 to 7,500 feet

*Effective annual precipitation:* 17 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly coarse sandy loam

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 24 to 48 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 1.3 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material  
A—1 to 7 inches; gravelly coarse sandy loam  
BC—7 to 25 inches; very gravelly loamy coarse sand  
Cr—25 to 38 inches; bedrock  
R—38 to 60 inches; bedrock

**Hiore and similar soils**

*Composition:* 30 percent  
*Geomorphic description:* Head slope on hill  
*Slope:* 20 to 50 percent, west to east aspects  
*Elevation:* 5,280 to 7,500 feet  
*Effective annual precipitation:* 17 to 19 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Gravelly coarse sandy loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Colluvium derived from granite  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 3.1 inches  
*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material  
A—2 to 14 inches; gravelly coarse sandy loam  
Bw—14 to 29 inches; very gravelly coarse sandy loam  
BC—29 to 60 inches; very gravelly loamy coarse sand

**Additional Components**

Rock outcrop: 10 percent  
Zonite and similar soils: 6 percent  
Stecum, very stony coarse sandy loam and similar soils: 4 percent

**316F—Stecum, very bouldery-Rock outcrop-Zonite, very bouldery complex, 20 to 50 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Forestland  
*Elevation:* 5,280 to 8,460 feet  
*Mean annual precipitation:* 15 to 23 inches  
*Frost-free period:* 50 to 70 days

**Component Description**

**Stecum, very bouldery and similar soils**

*Composition:* 35 percent  
*Geomorphic description:* Mountain slope  
*Slope:* 20 to 50 percent, east to west aspects  
*Elevation:* 5,280 to 8,460 feet  
*Effective annual precipitation:* 14 to 18 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Gravelly coarse sandy loam  
*Rock fragments on the soil surface:* 0.10 to 3.00 percent boulders, 20 to 83 feet apart

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 24 to 48 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 1.3 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

A—1 to 7 inches; gravelly coarse sandy loam

BC—7 to 25 inches; very gravelly loamy coarse sand

Cr—25 to 38 inches; bedrock

R—38 to 60 inches; bedrock

**Rock outcrop**

*Composition:* 25 percent

*Definition:* Moderately to strongly indurated quartz monzonite of the Boulder Batholith

**Zonite, very bouldery and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Mountain slope

*Slope:* 20 to 50 percent, east to west aspects

*Elevation:* 5,280 to 8,460 feet

*Effective annual precipitation:* 14 to 18 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very gravelly coarse sandy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent boulders, 20 to 83 feet apart

*Depth to restrictive feature:* Lithic bedrock: 6 to 10 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 0.4 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

A—1 to 4 inches; very gravelly coarse sandy loam

BC—4 to 9 inches; very gravelly loamy coarse sand

R—9 to 60 inches; bedrock

**Additional Components**

Caseypeak, very bouldery and similar soils: 10 percent

Hiore, very bouldery and similar soils: 10 percent

Comad, very bouldery and similar soils: 5 percent

**317E—Stecum-Caseypeak-Rock outcrop complex, 8 to 35 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,250 to 6,920 feet

*Mean annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

## Component Description

### **Stecum and similar soils**

*Composition:* 45 percent

*Geomorphic description:* Side slope on hill

*Slope:* 15 to 35 percent, east to west aspects

*Elevation:* 5,250 to 6,920 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly coarse sandy loam

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 24 to 48 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 1.3 inches

*Typical profile:*

- Oi—0 to 1 inches; slightly decomposed plant material
- A—1 to 7 inches; gravelly coarse sandy loam
- BC—7 to 25 inches; very gravelly loamy coarse sand
- Cr—25 to 38 inches; bedrock
- R—38 to 48 inches; bedrock

### **Caseypeak and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Nose slope on hill

*Slope:* 8 to 30 percent, east to west aspects

*Elevation:* 5,250 to 6,920 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly coarse sandy loam

*Depth to restrictive feature:*

- Paralithic bedrock: 10 to 20 inches
- Lithic bedrock: 12 to 24 inches

*Drainage class:* Well drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 0.9 inches

*Typical profile:*

- Oi—0 to 1 inches; slightly decomposed plant material
- A—1 to 7 inches; gravelly coarse sandy loam
- Bw—7 to 14 inches; very gravelly coarse sandy loam
- Cr—14 to 19 inches; bedrock
- R—19 to 60 inches; bedrock

### **Rock outcrop**

*Composition:* 15 percent

*Definition:* Moderately to strongly indurated quartz monzonite of the Boulder Batholith

### **Additional Components**

Tuggle and similar soils: 10 percent  
Basincreek and similar soils: 5 percent  
Goldflint and similar soils: 5 percent

## **319D—Silas, stony-Branham, stony-Tepete complex, 2 to 15 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Riparian-woodland  
*Elevation:* 5,230 to 6,790 feet  
*Mean annual precipitation:* 19 to 24 inches  
*Frost-free period:* 30 to 50 days

### **Component Description**

#### **Silas, stony and similar soils**

*Composition:* 35 percent  
*Geomorphic description:* Toeslope on hill  
*Slope:* 4 to 12 percent  
*Elevation:* 5,230 to 6,790 feet  
*Effective annual precipitation:* 19 to 24 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Sandy clay loam  
*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Moderately well drained  
*Parent material:* Mixed alluvium  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Water table:* Present  
*Available water capacity:* Mainly 11.0 inches  
*Typical profile:*  
Oe—0 to 2 inches; moderately decomposed plant material  
A1—2 to 18 inches; sandy clay loam  
A2—18 to 38 inches; loam  
C—38 to 72 inches; loam

#### **Branham, stony and similar soils**

*Composition:* 25 percent  
*Geomorphic description:* Toeslope on hill  
*Slope:* 6 to 15 percent  
*Elevation:* 5,230 to 6,790 feet  
*Effective annual precipitation:* 19 to 24 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Mucky loam  
*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart  
*Depth to restrictive feature:*  

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 24 to 56 inches

*Drainage class:* Well drained  
*Parent material:* Residuum weathered from granite  
*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 3.1 inches

*Typical profile:*

A—0 to 7 inches; mucky loam

Bw—7 to 17 inches; gravelly coarse sandy loam

BC—17 to 26 inches; gravelly coarse sandy loam

Cr—26 to 34 inches; bedrock

R—34 to 44 inches; bedrock

**Tepete and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Drainageway

*Slope:* 2 to 6 percent

*Elevation:* 5,230 to 6,790 feet

*Effective annual precipitation:* 19 to 24 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Mucky peat

*Depth to restrictive feature:* None noted

*Drainage class:* Very poorly drained

*Parent material:* Herbaceous organic material over loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Water table:* Present

*Available water capacity:* Mainly 4.5 inches

*Typical profile:*

Oi—0 to 12 inches; mucky peat

Oe—12 to 26 inches; mucky peat

Agb—26 to 38 inches; fine sandy loam

Cg—38 to 72 inches; gravelly sandy loam

**Additional Components**

Comad and similar soils: 10 percent

Hiore and similar soils: 10 percent

**321E—Beeftrail-Bavdark-Zonite complex, 8 to 35 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,560 to 6,150 feet

*Mean annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

**Component Description**

**Beeftrail and similar soils**

*Composition:* 40 percent

*Geomorphic description:* Side slope on hill

*Slope:* 15 to 35 percent

*Elevation:* 5,560 to 6,150 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Coarse sandy loam

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 28 to 56 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 2.2 inches

*Typical profile:*

- A—0 to 7 inches; coarse sandy loam
- Bw—7 to 14 inches; gravelly coarse sandy loam
- BC—14 to 26 inches; gravelly loamy coarse sand
- Cr—26 to 35 inches; bedrock
- R—35 to 45 inches; bedrock

**Bavdark and similar soils**

*Composition:* 30 percent

*Geomorphic description:*

- Head slope on complex hill
- Drainage swale

*Slope:* 15 to 35 percent

*Elevation:* 5,560 to 6,150 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly sandy clay loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Local alluvium derived from granite and/or colluvium derived from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 8.1 inches

*Typical profile:*

- A—0 to 20 inches; gravelly sandy clay loam
- Bt—20 to 36 inches; gravelly sandy clay loam
- BC—36 to 60 inches; gravelly coarse sandy loam

**Zonite and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Nose slope on hill

*Slope:* 8 to 35 percent

*Elevation:* 5,560 to 6,150 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly loamy coarse sand

*Depth to restrictive feature:*

- Paralithic bedrock: 4 to 10 inches
- Lithic bedrock: 6 to 20 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 0.5 inches



*Typical profile:*

- A—0 to 3 inches; gravelly loamy coarse sand
- BC—3 to 9 inches; very gravelly loamy coarse sand
- Cr—9 to 13 inches; bedrock
- R—13 to 23 inches; bedrock

**Additional Components**

Minestope and similar soils: 5 percent  
Bavdark, loamy substratum and similar soils: 4 percent  
Rock outcrop: 3 percent  
Zonite, moist and similar soils: 3 percent

**323E—Highrye-Tuggle, very stony-Moosejaw complex,  
2 to 25 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,360 to 6,230 feet  
*Mean annual precipitation:* 14 to 20 inches  
*Frost-free period:* 50 to 70 days

**Component Description**

**Highrye and similar soils**

*Composition:* 35 percent  
*Geomorphic description:*

- Toeslope on hill
- Footslope on hill

*Slope:* 6 to 12 percent  
*Elevation:* 5,360 to 6,230 feet  
*Effective annual precipitation:* 15 to 19 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Gravelly coarse sandy loam  
*Depth to restrictive feature:* Paralithic bedrock: 40 to 60 inches  
*Drainage class:* Well drained  
*Parent material:* Colluvium derived from granite over residuum weathered from granite  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 5.3 inches  
*Typical profile:*

- A—0 to 11 inches; gravelly coarse sandy loam
- Bt—11 to 32 inches; gravelly sandy clay loam
- BC—32 to 46 inches; gravelly coarse sandy loam
- C—46 to 56 inches; very gravelly coarse sand
- Cr—56 to 60 inches; bedrock

**Tuggle, very stony and similar soils**

*Composition:* 30 percent  
*Geomorphic description:*

- Shoulder on hill
- Backslope on hill

*Slope:* 6 to 25 percent  
*Elevation:* 5,360 to 6,230 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Sandy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 10 to 33 feet apart

*Depth to restrictive feature:*

- Paralithic bedrock: 10 to 20 inches
- Lithic bedrock: 14 to 24 inches

*Drainage class:* Well drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.6 inches

*Typical profile:*

A—0 to 6 inches; sandy loam

Bw—6 to 12 inches; gravelly coarse sandy loam

BC—12 to 14 inches; very gravelly loamy coarse sand

Cr—14 to 18 inches; bedrock

R—18 to 28 inches; bedrock

### **Moosejaw and similar soils**

*Composition:* 25 percent

*Geomorphic description:* Drainageway

*Slope:* 2 to 6 percent

*Elevation:* 5,360 to 6,230 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Mucky peat

*Depth to restrictive feature:* None noted

*Drainage class:* Very poorly drained

*Parent material:* Mixed alluvium over alluvium derived from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Water table:* Present

*Available water capacity:* Mainly 4.5 inches

*Typical profile:*

Oe—0 to 4 inches; mucky peat

A—4 to 22 inches; gravelly loamy coarse sand

Cg—22 to 48 inches; sandy loam

2Cg—48 to 72 inches; very gravelly coarse sand

### **Additional Components**

Zonite, very stony and similar soils: 10 percent

## **324E—Beeftrail, stony-Branham, stony-Fleecer complex, 8 to 20 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,450 to 6,180 feet

*Mean annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

## Component Description

### **Beeftrail, stony and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Interfluvial

*Slope:* 8 to 20 percent

*Elevation:* 5,450 to 6,180 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Coarse sandy loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 28 to 56 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 2.2 inches

*Typical profile:*

- A—0 to 7 inches; coarse sandy loam
- Bw—7 to 14 inches; gravelly coarse sandy loam
- BC—14 to 26 inches; gravelly loamy coarse sand
- Cr—26 to 35 inches; bedrock
- R—35 to 45 inches; bedrock

### **Branham, stony and similar soils**

*Composition:* 25 percent

*Geomorphic description:* Backslope on hill

*Slope:* 8 to 20 percent

*Elevation:* 5,450 to 6,180 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Coarse sandy loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 24 to 56 inches

*Drainage class:* Well drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.1 inches

*Typical profile:*

- A—0 to 7 inches; coarse sandy loam
- Bw—7 to 17 inches; gravelly coarse sandy loam
- BC—17 to 26 inches; gravelly coarse sandy loam
- Cr—26 to 34 inches; bedrock
- R—34 to 44 inches; bedrock

### **Fleecer and similar soils**

*Composition:* 20 percent

*Geomorphic description:*

- Footslope on hill
- Swale

*Slope:* 8 to 15 percent

*Elevation:* 5,450 to 6,180 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly coarse sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Local alluvium derived from granite and/or colluvium derived from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 4.9 inches

*Typical profile:*

A—0 to 24 inches; gravelly coarse sandy loam

Bw—24 to 34 inches; gravelly coarse sandy loam

BC—34 to 50 inches; gravelly loamy coarse sand

C—50 to 60 inches; gravelly loamy coarse sand

#### **Additional Components**

Zonite and similar soils: 10 percent

Danielvil and similar soils: 8 percent

Rock outcrop: 7 percent

### **326C—Fleecer-Branham-Passmore complex, 2 to 8 percent slopes**

#### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,180 to 6,360 feet

*Mean annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

#### **Component Description**

##### **Fleecer and similar soils**

*Composition:* 40 percent

*Geomorphic description:* Side slope of drainageway

*Slope:* 2 to 8 percent

*Elevation:* 5,180 to 6,360 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Local alluvium derived from granite and/or colluvium derived from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 6.9 inches

*Typical profile:*

A—0 to 18 inches; loam

Bw—18 to 34 inches; gravelly coarse sandy loam

BC—34 to 50 inches; gravelly loamy coarse sand

C—50 to 60 inches; gravelly loamy coarse sand

**Branham and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Side slopes of ridge

*Slope:* 4 to 8 percent

*Elevation:* 5,180 to 6,360 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 24 to 56 inches

*Drainage class:* Well drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.1 inches

*Typical profile:*

A—0 to 7 inches; loam

Bw—7 to 17 inches; gravelly coarse sandy loam

BC—17 to 26 inches; gravelly coarse sandy loam

Cr—26 to 34 inches; bedrock

R—34 to 44 inches; bedrock

**Passmore and similar soils**

*Composition:* 25 percent

*Geomorphic description:* Drainageway

*Slope:* 2 to 4 percent

*Elevation:* 5,180 to 6,360 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Mucky peat

*Depth to restrictive feature:* None noted

*Drainage class:* Somewhat poorly drained

*Parent material:* Loamy alluvium over alluvium derived from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Water table:* Present

*Available water capacity:* Mainly 5.8 inches

*Typical profile:*

Oe—0 to 2 inches; mucky peat

A—2 to 16 inches; loam

Bw—16 to 32 inches; sandy loam

2C—32 to 72 inches; gravelly coarse sand

**Additional Components**

Minestope and similar soils: 5 percent

## **327E—Highrye-Stecum-Wissikihon complex, 15 to 30 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,560 to 7,480 feet

*Mean annual precipitation:* 17 to 21 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Highrye and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Side slope on south-tending hill

*Slope:* 15 to 30 percent, east to northwest aspects

*Elevation:* 5,560 to 7,480 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Coarse sandy loam

*Depth to restrictive feature:* Paralithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Colluvium derived from granite over residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.3 inches

*Typical profile:*

A—0 to 11 inches; coarse sandy loam

Bt—11 to 32 inches; gravelly sandy clay loam

BC—32 to 46 inches; gravelly coarse sandy loam

C—46 to 56 inches; very gravelly coarse sand

Cr—56 to 60 inches; bedrock

#### **Stecum and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Side slope on south-tending hill

*Slope:* 25 to 30 percent, east to northwest aspects

*Elevation:* 5,560 to 7,480 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly coarse sandy loam

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 24 to 48 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 1.3 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

A—1 to 7 inches; gravelly coarse sandy loam

BC—7 to 25 inches; very gravelly loamy coarse sand

Cr—25 to 38 inches; bedrock

R—38 to 48 inches; bedrock

**Wissikihon and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Head slope on south-tending hill

*Slope:* 15 to 30 percent, east to northwest aspects

*Elevation:* 5,560 to 7,480 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly loamy coarse sand

*Depth to restrictive feature:* Paralithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Colluvium derived from granite over residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.0 inches

*Typical profile:*

A—0 to 8 inches; gravelly loamy coarse sand

Bw—8 to 16 inches; gravelly coarse sandy loam

BC—16 to 48 inches; gravelly loamy coarse sand

Cr—48 to 60 inches; bedrock

**Additional Components**

Minestope and similar soils: 10 percent

Zonite and similar soils: 3 percent

Rock outcrop: 2 percent

**328E—Stecum-Zonite-Basincreek complex, 8 to 45 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Forestland

*Elevation:* 5,560 to 6,920 feet

*Mean annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

**Component Description**

**Stecum and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Side slope on hill

*Slope:* 15 to 45 percent

*Elevation:* 5,560 to 6,920 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Coarse sandy loam

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 24 to 48 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 1.3 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material  
A—1 to 7 inches; coarse sandy loam  
BC—7 to 25 inches; very gravelly loamy coarse sand  
Cr—25 to 38 inches; bedrock  
R—38 to 48 inches; bedrock

**Zonite and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Nose slope on hill

*Slope:* 15 to 45 percent

*Elevation:* 5,560 to 6,920 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very gravelly coarse sandy loam

*Depth to restrictive feature:* Lithic bedrock: 6 to 10 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 0.4 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material  
A—1 to 4 inches; very gravelly coarse sandy loam  
BC—4 to 9 inches; very gravelly loamy coarse sand  
R—9 to 19 inches; bedrock

**Basincreek and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Base slope on hill

*Slope:* 8 to 35 percent

*Elevation:* 5,560 to 6,920 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Coarse sandy loam

*Depth to restrictive feature:* Lithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Colluvium derived from granite over residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 3.7 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material  
E—2 to 18 inches; coarse sandy loam  
E and Bw—18 to 38 inches; gravelly coarse sandy loam  
BC—38 to 46 inches; very gravelly sand  
R—46 to 60 inches; bedrock

**Additional Components**

Bobowic and similar soils: 10 percent

Rock outcrop: 10 percent

Branham and similar soils: 5 percent

Stecum, very stony coarse sandy loam and similar soils: 5 percent



### **331C—Mooseflat, occasionally flooded-Foolhen, occasionally flooded-Fleecer complex, 2 to 8 percent slopes**

#### **Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,710 to 7,220 feet  
*Mean annual precipitation:* 15 to 19 inches  
*Frost-free period:* 50 to 70 days

#### **Component Description**

##### **Mooseflat and similar soils**

*Composition:* 50 percent  
*Geomorphic description:* Flood plain  
*Slope:* 2 to 4 percent  
*Elevation:* 5,710 to 7,220 feet  
*Effective annual precipitation:* 15 to 19 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Mucky peat  
*Depth to restrictive feature:* None noted  
*Drainage class:* Very poorly drained  
*Parent material:* Mixed alluvium over alluvium derived from granite  
*Native plant cover type:* Rangeland  
*Flooding:* Occasional  
*Water table:* Present  
*Available water capacity:* Mainly 5.1 inches  
*Typical profile:*  
    Oe—0 to 5 inches; mucky peat  
    A—5 to 14 inches; loam  
    Bg—14 to 28 inches; sandy clay loam  
    2Cg—28 to 72 inches; very gravelly coarse sand

##### **Foolhen and similar soils**

*Composition:* 25 percent  
*Geomorphic description:* Flood plain  
*Slope:* 2 to 8 percent  
*Elevation:* 5,710 to 7,220 feet  
*Effective annual precipitation:* 15 to 19 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Mucky peat  
*Depth to restrictive feature:* None noted  
*Drainage class:* Poorly drained  
*Parent material:* Alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* Occasional  
*Water table:* Present  
*Available water capacity:* Mainly 7.5 inches  
*Typical profile:*  
    Oe—0 to 4 inches; mucky peat  
    A—4 to 16 inches; loam  
    Bw—16 to 40 inches; sandy clay loam  
    Cg—40 to 72 inches; gravelly coarse sandy loam

**Fleecer and similar soils**

*Composition:* 20 percent  
*Geomorphic description:* Side slope of drainageway  
*Slope:* 2 to 8 percent  
*Elevation:* 5,710 to 7,220 feet  
*Effective annual precipitation:* 15 to 19 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Local alluvium derived from granite  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 6.9 inches  
*Typical profile:*  
    A—0 to 18 inches; loam  
    Bw—18 to 34 inches; gravelly coarse sandy loam  
    BC—34 to 50 inches; gravelly loamy coarse sand  
    C—50 to 60 inches; gravelly loamy coarse sand

**Additional Components**

Water: 5 percent

**332D—Bobowic-Goldflint complex, 4 to 25 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Forestland  
*Elevation:* 6,500 to 7,360 feet  
*Mean annual precipitation:* 17 to 22 inches  
*Frost-free period:* 30 to 50 days

**Component Description**

**Bobowic and similar soils**

*Composition:* 65 percent  
*Geomorphic description:* Ridge  
*Slope:* 4 to 15 percent  
*Elevation:* 6,500 to 7,370 feet  
*Effective annual precipitation:* 17 to 22 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Coarse sandy loam  
*Depth to restrictive feature:*  
    • Paralithic bedrock: 20 to 40 inches  
    • Lithic bedrock: 22 to 48 inches  
*Drainage class:* Well drained  
*Parent material:* Residuum weathered from granite  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 2.1 inches  
*Typical profile:*  
    Oi—0 to 1 inches; slightly decomposed plant material  
    E—1 to 11 inches; coarse sandy loam  
    Bw—11 to 21 inches; gravelly coarse sandy loam  
    BC—21 to 29 inches; very gravelly loamy coarse sand

Cr—29 to 34 inches; bedrock

R—34 to 60 inches; bedrock

**Goldflint and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Ridge

*Slope:* 4 to 25 percent

*Elevation:* 6,500 to 7,370 feet

*Effective annual precipitation:* 17 to 22 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Loamy coarse sand

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 0.8 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

A—1 to 4 inches; loamy coarse sand

Bw—4 to 9 inches; gravelly loamy coarse sand

BC—9 to 18 inches; very gravelly coarse sand

R—18 to 28 inches; bedrock

**Additional Components**

Basincreek and similar soils: 10 percent

Branham and similar soils: 8 percent

Rock outcrop: 2 percent

**333E—Stecum-Hiore-Rock outcrop complex, 15 to 35 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Forestland

*Elevation:* 5,560 to 6,870 feet

*Mean annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

**Component Description**

**Stecum and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Side slope on mountain

*Slope:* 15 to 35 percent

*Elevation:* 5,560 to 6,870 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly loamy coarse sand

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 24 to 48 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 1.3 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

A—1 to 7 inches; gravelly loamy coarse sand

BC—7 to 25 inches; very gravelly loamy coarse sand

Cr—25 to 38 inches; bedrock

R—38 to 48 inches; bedrock

**Hiore and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Head slope on mountain

*Slope:* 15 to 35 percent

*Elevation:* 5,560 to 6,870 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Coarse sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 3.1 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

A—2 to 14 inches; coarse sandy loam

Bw—14 to 29 inches; very gravelly coarse sandy loam

BC—29 to 60 inches; very gravelly loamy coarse sand

**Rock outcrop**

*Composition:* 15 percent

*Definition:* Moderately to strongly indurated quartz monzonite of the Boulder Batholith

**Additional Components**

Bobowic and similar soils: 10 percent

Goldflint and similar soils: 10 percent

Basincreek and similar soils: 5 percent

Branham and similar soils: 5 percent

Stecum, very stony and similar soils: 5 percent

**335E—Stecum-Goldflint-Branham complex, 12 to 35 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Forestland

*Elevation:* 5,250 to 6,820 feet

*Mean annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

## Component Description

### **Stecum and similar soils**

*Composition:* 45 percent

*Geomorphic description:* Side slope on hill

*Slope:* 12 to 35 percent

*Elevation:* 5,250 to 6,820 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly coarse sandy loam

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 24 to 48 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 1.3 inches

*Typical profile:*

- Oi—0 to 1 inches; slightly decomposed plant material
- A—1 to 7 inches; gravelly coarse sandy loam
- BC—7 to 25 inches; very gravelly loamy coarse sand
- Cr—25 to 38 inches; bedrock
- R—38 to 48 inches; bedrock

### **Goldflint and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Nose slope on hill

*Slope:* 12 to 35 percent

*Elevation:* 5,250 to 6,820 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly loamy coarse sand

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 0.8 inches

*Typical profile:*

- Oi—0 to 1 inches; slightly decomposed plant material
- A—1 to 4 inches; gravelly loamy coarse sand
- Bw—4 to 9 inches; gravelly loamy coarse sand
- BC—9 to 18 inches; very gravelly coarse sand
- R—18 to 28 inches; bedrock

### **Branham and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Side slope on hill

*Slope:* 12 to 35 percent

*Elevation:* 5,250 to 6,820 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly coarse sandy loam

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 24 to 56 inches

*Drainage class:* Well drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 3.1 inches

*Typical profile:*

- A—0 to 7 inches; gravelly coarse sandy loam
- Bw—7 to 17 inches; gravelly coarse sandy loam
- BC—17 to 26 inches; gravelly coarse sandy loam
- Cr—26 to 34 inches; bedrock
- R—34 to 44 inches; bedrock

### **Additional Components**

Peeler, sandy substratum and similar soils: 12 percent

Rock outcrop: 5 percent

Bavdark and similar soils: 3 percent

## **340E—Peeler gravelly sandy loam, 8 to 25 percent slopes, stony**

### **Map Unit Setting**

*Interpretive focus:* Forestland

*Elevation:* 6,090 to 7,320 feet

*Mean annual precipitation:* 19 to 24 inches

*Frost-free period:* 30 to 50 days

### **Component Description**

#### **Peeler and similar soils**

*Composition:* 85 percent

*Geomorphic description:* Mountainbase

*Slope:* 8 to 25 percent

*Elevation:* 6,090 to 7,320 feet

*Effective annual precipitation:* 19 to 24 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Gravelly sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 4.3 inches

*Typical profile:*

- Oi—0 to 1 inches; slightly decomposed plant material
- Oe—1 to 2 inches; moderately decomposed plant material
- E—2 to 14 inches; gravelly sandy loam
- E/Bt—14 to 24 inches; gravelly coarse sandy loam
- Bt—24 to 38 inches; gravelly sandy clay loam
- BC—38 to 60 inches; very gravelly loamy coarse sand

### **Additional Components**

Basincreek and similar soils: 12 percent  
Foolhen and similar soils: 3 percent

## **344A—Valleyflat complex, 0 to 2 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,460 to 5,680 feet  
*Mean annual precipitation:* 12 to 14 inches  
*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Valleyflat and similar soils**

*Composition:* 75 percent  
*Geomorphic description:* Relic alluvial flat  
*Slope:* 0 to 2 percent  
*Elevation:* 5,460 to 5,680 feet  
*Effective annual precipitation:* 12 to 14 inches  
*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Sandy loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Alluvium derived from granite  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 2.6 inches  
*Typical profile:*  
    A1—0 to 2 inches; sandy loam  
    A2—2 to 5 inches; sandy loam  
    Bw—5 to 10 inches; coarse sandy loam  
    2C—10 to 72 inches; stratified gravelly coarse sand to very gravelly coarse sand

#### **Valleyflat, thin surface and similar soils**

*Composition:* 20 percent  
*Geomorphic description:* Micro-low on relic alluvial flat  
*Slope:* 0 to 2 percent  
*Elevation:* 5,460 to 5,680 feet  
*Effective annual precipitation:* 12 to 14 inches  
*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Coarse sandy loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Alluvium derived from granite  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 2.4 inches  
*Typical profile:*  
    A—0 to 2 inches; coarse sandy loam  
    Bw—2 to 8 inches; coarse sandy loam  
    2C—8 to 72 inches; stratified gravelly coarse sand to very gravelly coarse sand

### **Additional Components**

Pitchstone and similar soils: 3 percent  
Pits, borrow: 1 percent  
Valleyflat, greater slopes and similar soils: 1 percent

## **345D—Adit, moderately impacted, stony-Rock outcrop complex, 4 to 15 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,360 to 5,790 feet  
*Mean annual precipitation:* 11 to 14 inches  
*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Adit, moderately impacted, stony and similar soils**

*Composition:* 60 percent  
*Geomorphic description:* Nose slope on south-tending hill  
*Slope:* 4 to 15 percent, east to northwest aspects  
*Elevation:* 5,360 to 5,790 feet  
*Effective annual precipitation:* 10 to 13 inches  
*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Stony coarse sandy loam  
*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart  
*Depth to restrictive feature:*

- Paralithic bedrock: 4 to 12 inches
- Lithic bedrock: 10 to 20 inches

*Drainage class:* Somewhat excessively drained  
*Parent material:* Residuum weathered from granite  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 0.3 inches  
*Typical profile:*

- A1—0 to 0 inches; stony coarse sandy loam
- A2—0 to 2 inches; stony coarse sandy loam
- BC—2 to 7 inches; very gravelly loamy coarse sand
- Cr—7 to 14 inches; bedrock
- R—14 to 60 inches; bedrock

#### **Rock outcrop**

*Composition:* 20 percent  
*Definition:* Exposures of very strongly indurated aplite bedrock of the Boulder Batholith

### **Additional Components**

Modess, moderately impacted and similar soils: 10 percent  
Nuley, moderately impacted and similar soils: 5 percent  
Dumps, mine: 4 percent  
Varney, moderately impacted and similar soils: 1 percent



## **347D—Nuley-Modess complex, 2 to 12 percent slopes, moderately impacted**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,250 to 5,770 feet

*Mean annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Nuley, moderately impacted and similar soils**

*Composition:* 65 percent

*Geomorphic description:* Side slope on hill

*Slope:* 2 to 12 percent

*Elevation:* 5,250 to 5,770 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Loam

*Depth to restrictive feature:*

- Paralithic bedrock: 40 to 60 inches
- Lithic bedrock: Greater than 56 inches

*Drainage class:* Well drained

*Parent material:* Colluvium over residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.2 inches

*Typical profile:*

- A1—0 to 0 inches; loam
- A2—0 to 6 inches; loam
- Bt—6 to 18 inches; loam
- Bk—18 to 30 inches; sandy loam
- 2C—30 to 44 inches; gravelly loamy coarse sand
- Cr—44 to 56 inches; bedrock
- R—56 to 60 inches; bedrock

#### **Modess, moderately impacted and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Nose slope on hill

*Slope:* 2 to 12 percent

*Elevation:* 5,250 to 5,770 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 34 to 72 inches

*Drainage class:* Well drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 4.5 inches

*Typical profile:*

A1—0 to 0 inches; sandy loam  
A2—0 to 11 inches; sandy loam  
Bw—11 to 18 inches; sandy clay loam  
Bk—18 to 30 inches; gravelly coarse sandy loam  
BC—30 to 38 inches; gravelly loamy coarse sand  
Cr—38 to 58 inches; bedrock  
R—58 to 60 inches; bedrock

**Additional Components**

Varney, moderately impacted and similar soils: 8 percent  
Adit, moderately impacted, stony and similar soils: 5 percent  
Modess, greater slopes, moderately impacted and similar soils: 5 percent  
Rock outcrop: 2 percent

**348E—Adit, moderately impacted, stony-Rock outcrop-  
Modess, moderately impacted complex, 8 to 30 percent  
slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,350 to 5,840 feet  
*Mean annual precipitation:* 12 to 14 inches  
*Frost-free period:* 70 to 90 days

**Component Description**

**Adit, moderately impacted, stony and similar soils**

*Composition:* 35 percent  
*Geomorphic description:* Nose slope on south-facing hill  
*Slope:* 8 to 30 percent, east to northwest aspects  
*Elevation:* 5,350 to 5,840 feet  
*Effective annual precipitation:* 10 to 13 inches  
*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Stony coarse sandy loam  
*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart  
*Depth to restrictive feature:*

- Paralithic bedrock: 4 to 12 inches
- Lithic bedrock: 10 to 20 inches

*Drainage class:* Somewhat excessively drained  
*Parent material:* Residuum weathered from granite  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 0.3 inches  
*Typical profile:*

A1—0 to 0 inches; stony coarse sandy loam  
A2—0 to 2 inches; stony coarse sandy loam  
BC—2 to 7 inches; very gravelly loamy coarse sand  
Cr—7 to 14 inches; bedrock  
R—14 to 60 inches; bedrock

**Rock outcrop**

*Composition:* 30 percent

*Definition:* Exposures of very strongly indurated aplite bedrock embedded in the Boulder Batholith

**Modess, moderately impacted and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Side slope on south-facing hill

*Slope:* 15 to 30 percent, east to northwest aspects

*Elevation:* 5,350 to 5,840 feet

*Effective annual precipitation:* 10 to 13 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Gravelly coarse sandy loam

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 34 to 72 inches

*Drainage class:* Well drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 4.5 inches

*Typical profile:*

- A1—0 to 0 inches; gravelly coarse sandy loam
- A2—0 to 11 inches; gravelly coarse sandy loam
- Bw—11 to 18 inches; sandy clay loam
- Bk—18 to 30 inches; gravelly coarse sandy loam
- BC—30 to 38 inches; gravelly loamy coarse sand
- Cr—38 to 58 inches; bedrock
- R—58 to 60 inches; bedrock

**Nuley, moderately impacted and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Base slope on south-facing hill

*Slope:* 8 to 25 percent, east to northwest aspects

*Elevation:* 5,350 to 5,840 feet

*Effective annual precipitation:* 10 to 13 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:*

- Paralithic bedrock: 40 to 60 inches
- Lithic bedrock: Greater than 56 inches

*Drainage class:* Well drained

*Parent material:* Colluvium over residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.2 inches

*Typical profile:*

- A1—0 to 0 inches; sandy loam
- A2—0 to 6 inches; sandy loam
- Bt—6 to 18 inches; loam
- Bk—18 to 30 inches; sandy loam
- 2C—30 to 44 inches; gravelly loamy coarse sand
- Cr—44 to 56 inches; bedrock
- R—56 to 60 inches; bedrock

## **349D—Modess-Anaconda complex, 2 to 15 percent slopes, moderately impacted**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,200 to 6,300 feet

*Mean annual precipitation:* 10 to 14 inches

*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Modess, moderately impacted and similar soils**

*Composition:* 70 percent

*Geomorphic description:*

- Nose slope on hill
- Interfluvium on hill

*Slope:* 4 to 15 percent

*Elevation:* 5,200 to 6,300 feet

*Effective annual precipitation:* 10 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Coarse sandy loam

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 46 inches
- Lithic bedrock: 34 to 72 inches

*Drainage class:* Well drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 4.9 inches

*Typical profile:*

- A1—0 to 0 inches; coarse sandy loam
- A2—0 to 11 inches; coarse sandy loam
- Bw—11 to 18 inches; sandy clay loam
- Bk—18 to 30 inches; gravelly coarse sandy loam
- BC—30 to 38 inches; gravelly loamy coarse sand
- Cr—38 to 58 inches; bedrock
- R—58 to 60 inches; bedrock

#### **Anaconda, moderately impacted and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Side slope on hill

*Slope:* 2 to 8 percent

*Elevation:* 5,200 to 6,300 feet

*Effective annual precipitation:* 10 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium derived from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 7.0 inches

*Typical profile:*

- A1—0 to 0 inches; sandy loam
- A2—0 to 8 inches; sandy loam
- Bw—8 to 17 inches; sandy loam
- Bk—17 to 36 inches; coarse sandy loam
- BC—36 to 60 inches; loamy sand

**Additional Components**

Adit, moderately impacted and similar soils: 5 percent  
Modess, greater slopes, moderately impacted and similar soils: 5 percent  
Varney, moderately impacted and similar soils: 3 percent  
Rock outcrop: 2 percent

**353C—Highrye-Wissikihon-Beeftrail complex, 2 to 8 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,350 to 5,690 feet  
*Mean annual precipitation:* 15 to 17 inches  
*Frost-free period:* 50 to 70 days

**Component Description**

**Highrye and similar soils**

*Composition:* 50 percent  
*Geomorphic description:*

- Local fan
- Side slope on hillside

*Slope:* 2 to 8 percent  
*Elevation:* 5,350 to 5,690 feet  
*Effective annual precipitation:* 15 to 17 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Loam  
*Depth to restrictive feature:* Paralithic bedrock: 40 to 60 inches  
*Drainage class:* Well drained  
*Parent material:* Colluvium over residuum weathered from granite  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 5.3 inches  
*Typical profile:*

- A—0 to 11 inches; loam
- Bt—11 to 32 inches; gravelly sandy clay loam
- BC—32 to 46 inches; gravelly coarse sandy loam
- C—46 to 56 inches; very gravelly coarse sand
- Cr—56 to 60 inches; bedrock

**Wissikihon and similar soils**

*Composition:* 20 percent  
*Geomorphic description:* Ridge  
*Slope:* 2 to 8 percent  
*Elevation:* 5,350 to 5,690 feet  
*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:* Paralithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Colluvium derived from granite over residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.0 inches

*Typical profile:*

A—0 to 8 inches; sandy loam

Bw—8 to 16 inches; gravelly coarse sandy loam

BC—16 to 48 inches; gravelly loamy coarse sand

Cr—48 to 60 inches; bedrock

### **Beeftrail and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Ridge

*Slope:* 2 to 8 percent

*Elevation:* 5,350 to 5,690 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Coarse sandy loam

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches

- Lithic bedrock: 28 to 56 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 2.2 inches

*Typical profile:*

A—0 to 7 inches; coarse sandy loam

Bw—7 to 14 inches; gravelly coarse sandy loam

BC—14 to 26 inches; gravelly loamy coarse sand

Cr—26 to 35 inches; bedrock

R—35 to 45 inches; bedrock

### **Additional Components**

Dinnen and similar soils: 10 percent

Highrye, greater slopes and similar soils: 5 percent

## **356E—Peeler-Bobowic-Zonite complex, 8 to 30 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Forestland

*Elevation:* 5,990 to 6,860 feet

*Mean annual precipitation:* 15 to 17 inches

*Frost-free period:* 40 to 60 days

## Component Description

### Peeler and similar soils

*Composition:* 40 percent

*Geomorphic description:* Head slope on north-tending hillside

*Slope:* 8 to 30 percent, west to southeast aspects

*Elevation:* 5,990 to 6,860 feet

*Effective annual precipitation:* 16 to 19 inches

*Frost-free period:* 40 to 60 days

*Surface layer texture:* Coarse sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 6.4 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

Oe—1 to 2 inches; moderately decomposed plant material

E—2 to 14 inches; coarse sandy loam

E/Bt—14 to 24 inches; gravelly coarse sandy loam

Bt—24 to 38 inches; sandy clay loam

BC—38 to 60 inches; sandy loam

### Bobowic and similar soils

*Composition:* 20 percent

*Geomorphic description:* Side slope on north-tending hillside

*Slope:* 8 to 30 percent, west to southeast aspects

*Elevation:* 5,990 to 6,860 feet

*Effective annual precipitation:* 16 to 19 inches

*Frost-free period:* 40 to 60 days

*Surface layer texture:* Coarse sandy loam

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 22 to 48 inches

*Drainage class:* Well drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 2.1 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

E—1 to 11 inches; coarse sandy loam

Bw—11 to 21 inches; gravelly coarse sandy loam

BC—21 to 29 inches; very gravelly loamy coarse sand

Cr—29 to 34 inches; bedrock

R—34 to 60 inches; bedrock

### Zonite and similar soils

*Composition:* 15 percent

*Geomorphic description:* Nose slope on north-tending hillside

*Slope:* 8 to 25 percent, west to southeast aspects

*Elevation:* 5,990 to 6,860 feet

*Effective annual precipitation:* 16 to 19 inches

*Frost-free period:* 40 to 60 days

*Surface layer texture:* Gravelly loamy coarse sand  
*Depth to restrictive feature:* Lithic bedrock: 4 to 10 inches  
*Drainage class:* Somewhat excessively drained  
*Parent material:* Residuum weathered from granite  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 0.4 inches  
*Typical profile:*  
    Oi—0 to 1 inches; slightly decomposed plant material  
    A—1 to 4 inches; gravelly loamy coarse sand  
    BC—4 to 9 inches; very gravelly loamy coarse sand  
    R—9 to 19 inches; bedrock

#### **Additional Components**

Caseypeak and similar soils: 10 percent  
Silas and similar soils: 8 percent  
Rubick and similar soils: 5 percent  
Rock outcrop: 2 percent

### **357D—Beeftrail-Dinnen-Tuggle complex, 4 to 25 percent slopes**

#### **Map Unit Setting**

*Interpretive focus:* Rangeland and forestland  
*Elevation:* 6,020 to 6,920 feet  
*Mean annual precipitation:* 15 to 17 inches  
*Frost-free period:* 50 to 70 days

#### **Component Description**

##### **Beeftrail and similar soils**

*Composition:* 30 percent  
*Geomorphic description:* Ridge  
*Slope:* 4 to 25 percent  
*Elevation:* 6,020 to 6,920 feet  
*Effective annual precipitation:* 15 to 17 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Sandy loam  
*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 28 to 56 inches

*Drainage class:* Somewhat excessively drained  
*Parent material:* Residuum weathered from granite  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 2.9 inches  
*Typical profile:*  
    A—0 to 11 inches; sandy loam  
    Bw—11 to 32 inches; gravelly sandy clay loam  
    BC—32 to 46 inches; gravelly coarse sandy loam  
    C—46 to 56 inches; very gravelly coarse sand  
    Cr—56 to 60 inches; bedrock



**Dinnen and similar soils**

*Composition:* 25 percent

*Geomorphic description:* Side slope on hill

*Slope:* 8 to 25 percent

*Elevation:* 6,020 to 6,920 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:* Paralithic bedrock: Greater than 53 inches

*Drainage class:* Well drained

*Parent material:* Colluvium over residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 6.1 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

A—2 to 9 inches; sandy loam

Bw—9 to 21 inches; gravelly coarse sandy loam

BC—21 to 41 inches; gravelly coarse sandy loam

C—41 to 53 inches; gravelly loamy coarse sand

Cr—53 to 60 inches; bedrock

**Tuggle and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Ridge

*Slope:* 4 to 15 percent

*Elevation:* 6,020 to 6,920 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Coarse sandy loam

*Depth to restrictive feature:*

- Paralithic bedrock: 10 to 20 inches
- Lithic bedrock: Greater than 18 inches

*Drainage class:* Well drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.6 inches

*Typical profile:*

A—0 to 6 inches; coarse sandy loam

Bw—6 to 12 inches; gravelly coarse sandy loam

BC—12 to 14 inches; very gravelly loamy coarse sand

Cr—14 to 18 inches; bedrock

R—18 to 28 inches; bedrock

**Additional Components**

Caseypeak and similar soils: 10 percent

Highrye and similar soils: 10 percent

Rock outcrop: 5 percent

Zonite and similar soils: 5 percent

### **360B—Tepete mucky peat, 1 to 4 percent slopes, rarely flooded**

#### **Map Unit Setting**

*Interpretive focus:* Riparian

*Elevation:* 7,400 to 7,860 feet

*Mean annual precipitation:* 19 to 24 inches

*Frost-free period:* 30 to 50 days

#### **Component Description**

##### **Tepete and similar soils**

*Composition:* 90 percent

*Geomorphic description:* Bog

*Slope:* 1 to 4 percent

*Elevation:* 7,400 to 7,860 feet

*Effective annual precipitation:* 19 to 24 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Mucky peat

*Depth to restrictive feature:* None noted

*Drainage class:* Very poorly drained

*Parent material:* Herbaceous organic material over loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* Rare

*Water table:* Present

*Available water capacity:* Mainly 4.5 inches

*Typical profile:*

Oi—0 to 12 inches; mucky peat

Oe—12 to 26 inches; mucky peat

Agb—26 to 38 inches; fine sandy loam

Cg—38 to 72 inches; gravelly sandy loam

#### **Additional Components**

Passmore and similar soils: 5 percent

Riverwash: 5 percent

### **361G—Rock outcrop-Goldflint-Rubble land complex, 45 to 80 percent slopes**

#### **Map Unit Setting**

*Interpretive focus:* Forestland

*Elevation:* 5,720 to 8,230 feet

*Mean annual precipitation:* 18 to 24 inches

*Frost-free period:* 25 to 50 days

#### **Component Description**

##### **Rock outcrop**

*Composition:* 35 percent

*Definition:* Abundant rock outcrops of strongly indurated quartz monzonite of the Boulder Batholith and associated colluvial boulders

**Goldflint and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Mountainflank, upper third on mountainside

*Slope:* 45 to 80 percent

*Elevation:* 5,720 to 8,230 feet

*Effective annual precipitation:* 18 to 24 inches

*Frost-free period:* 25 to 50 days

*Surface layer texture:* Very stony loamy coarse sand

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 0.8 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

A—1 to 4 inches; very stony loamy coarse sand

Bw—4 to 9 inches; gravelly loamy coarse sand

BC—9 to 18 inches; very gravelly coarse sand

R—18 to 28 inches; bedrock

**Rubble land**

*Composition:* 20 percent

*Definition:* Abundant rock outcrops of strongly indurated quartz monzonite of the Boulder Batholith and associated colluvial boulders

**Additional Components**

Stecum and similar soils: 10 percent

Zonite and similar soils: 10 percent

Comad and similar soils: 5 percent

**362E—Comad-Stecum complex, 8 to 30 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Forestland

*Elevation:* 6,510 to 8,090 feet

*Mean annual precipitation:* 19 to 24 inches

*Frost-free period:* 30 to 50 days

**Component Description**

**Comad and similar soils**

*Composition:* 50 percent

*Geomorphic description:*

- Mountaintop on mountain
- Mountainflank, upper third on mountain

*Slope:* 8 to 20 percent

*Elevation:* 6,510 to 8,090 feet

*Effective annual precipitation:* 20 to 24 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Gravelly coarse sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Excessively drained

*Parent material:* Colluvium derived from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 2.3 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

E—2 to 8 inches; gravelly coarse sandy loam

E and Bt—8 to 26 inches; very gravelly loamy coarse sand

C—26 to 60 inches; very gravelly coarse sand

#### **Stecum and similar soils**

*Composition:* 35 percent

*Geomorphic description:*

- Mountainflank, upper third on mountain
- Mountaintop on mountain

*Slope:* 8 to 30 percent

*Elevation:* 6,510 to 8,090 feet

*Effective annual precipitation:* 20 to 24 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Very stony loamy coarse sand

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 24 to 48 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 1.2 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

A—1 to 7 inches; very stony loamy coarse sand

BC—7 to 25 inches; very stony coarse sand

Cr—25 to 38 inches; bedrock

R—38 to 48 inches; bedrock

#### **Additional Components**

Rock outcrop: 10 percent

Zonite and similar soils: 5 percent

### **363C—Tepete mucky peat, sandy substratum, 2 to 6 percent slopes**

#### **Map Unit Setting**

*Interpretive focus:* Riparian forest

*Elevation:* 7,120 to 7,960 feet

*Mean annual precipitation:* 19 to 24 inches

*Frost-free period:* 30 to 50 days

#### **Component Description**

##### **Tepete, sandy substratum and similar soils**

*Composition:* 90 percent

*Geomorphic description:* Fen

*Slope:* 2 to 6 percent

*Elevation:* 7,120 to 7,960 feet  
*Effective annual precipitation:* 19 to 24 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Mucky peat  
*Depth to restrictive feature:* None noted  
*Drainage class:* Very poorly drained  
*Parent material:* Herbaceous organic material over mainly sandy alluvium derived from granite  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Water table:* Present  
*Available water capacity:* Mainly 2.6 inches  
*Typical profile:*  
Oi—0 to 7 inches; mucky peat  
Oe—7 to 18 inches; mucky peat  
AC—18 to 24 inches; stratified gravelly coarse sand to fine sandy loam  
Oe—24 to 29 inches; mucky peat  
Cg—29 to 54 inches; gravelly coarse sand  
2Cg—54 to 66 inches; loam  
3Cg—66 to 72 inches; gravelly coarse sand

#### **Additional Components**

Passmore and similar soils: 10 percent

### **364F—Comad-Goldflint-Rock outcrop complex, 20 to 50 percent slopes**

#### **Map Unit Setting**

*Interpretive focus:* Forestland  
*Elevation:* 5,820 to 8,150 feet  
*Mean annual precipitation:* 19 to 25 inches  
*Frost-free period:* 20 to 50 days

#### **Component Description**

##### **Comad and similar soils**

*Composition:* 35 percent  
*Geomorphic description:* North-facing mountainside  
*Slope:* 20 to 50 percent, west to east aspects  
*Elevation:* 5,820 to 8,150 feet  
*Effective annual precipitation:* 22 to 30 inches  
*Frost-free period:* 20 to 50 days  
*Surface layer texture:* Stony coarse sandy loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Excessively drained  
*Parent material:* Colluvium derived from granite  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 2.1 inches  
*Typical profile:*  
Oi—0 to 2 inches; slightly decomposed plant material  
E—2 to 8 inches; stony coarse sandy loam  
E and Bt—8 to 26 inches; very stony loamy coarse sand  
C—26 to 60 inches; extremely stony sand

**Goldflint and similar soils**

*Composition:* 20 percent

*Geomorphic description:* North-facing mountainside

*Slope:* 25 to 50 percent, west to east aspects

*Elevation:* 5,820 to 8,150 feet

*Effective annual precipitation:* 22 to 30 inches

*Frost-free period:* 20 to 50 days

*Surface layer texture:* Gravelly coarse sandy loam

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 0.8 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

A—1 to 4 inches; gravelly coarse sandy loam

Bw—4 to 9 inches; gravelly loamy coarse sand

BC—9 to 18 inches; very gravelly coarse sand

R—18 to 28 inches; bedrock

**Rock outcrop**

*Composition:* 15 percent

*Definition:* Moderately to strongly indurated quartz monzonite of the Boulder Batholith

**Additional Components**

Stecum and similar soils: 12 percent

Rubick and similar soils: 10 percent

Zonite and similar soils: 8 percent

**365F—Stecum-Rock outcrop-Goldflint complex, 30 to 60 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Forestland

*Elevation:* 6,680 to 8,170 feet

*Mean annual precipitation:* 17 to 21 inches

*Frost-free period:* 30 to 55 days

**Component Description**

**Stecum and similar soils**

*Composition:* 35 percent

*Geomorphic description:* South-tending mountainside

*Slope:* 30 to 60 percent, east to west aspects

*Elevation:* 6,680 to 8,170 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 30 to 55 days

*Surface layer texture:* Very stony loamy coarse sand

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 24 to 48 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 1.2 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

A—1 to 7 inches; very stony loamy coarse sand

BC—7 to 25 inches; very stony coarse sand

Cr—25 to 38 inches; bedrock

R—38 to 48 inches; bedrock

### **Rock outcrop**

*Composition:* 30 percent

*Definition:* Moderately to strongly indurated quartz monzonite of the Boulder Batholith

### **Goldflint and similar soils**

*Composition:* 20 percent

*Geomorphic description:* South-tending mountainside

*Slope:* 30 to 60 percent, east to west aspects

*Elevation:* 6,680 to 8,170 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 30 to 55 days

*Surface layer texture:* Gravelly coarse sandy loam

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 0.8 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

A—1 to 4 inches; gravelly coarse sandy loam

Bw—4 to 9 inches; gravelly loamy coarse sand

BC—9 to 18 inches; very gravelly coarse sand

R—18 to 28 inches; bedrock

### **Additional Components**

Stecum, gravelly loamy coarse sand and similar soils: 10 percent

Comad and similar soils: 5 percent

## **366F—Stecum-Rock outcrop-Basincreek complex, 25 to 50 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Forestland

*Elevation:* 5,790 to 8,050 feet

*Mean annual precipitation:* 17 to 22 inches

*Frost-free period:* 30 to 50 days

### **Component Description**

#### **Stecum and similar soils**

*Composition:* 35 percent

*Geomorphic description:* South-tending mountainside

*Slope:* 30 to 50 percent, east to northwest aspects

*Elevation:* 5,790 to 8,050 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Very gravelly loamy coarse sand

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 24 to 48 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 1.2 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

A—1 to 7 inches; very gravelly loamy coarse sand

BC—7 to 25 inches; very stony coarse sand

Cr—25 to 38 inches; bedrock

R—38 to 48 inches; bedrock

### **Rock outcrop**

*Composition:* 30 percent

*Definition:* Moderately to strongly indurated quartz monzonite of the Boulder Batholith

### **Basincreek and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Mountainbase on south-tending mountainside

*Slope:* 25 to 45 percent, east to northwest aspects

*Elevation:* 5,790 to 8,050 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Coarse sandy loam

*Depth to restrictive feature:* Lithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Colluvium derived from granite over residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 3.7 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

E—2 to 18 inches; coarse sandy loam

E and Bw—18 to 38 inches; gravelly coarse sandy loam

BC—38 to 46 inches; very gravelly sand

R—46 to 60 inches; bedrock

### **Additional Components**

Stecum, very stony loamy coarse sand and similar soils: 10 percent

Zonite and similar soils: 10 percent



## **367G—Rubble land-Stecum-Zonite complex, 35 to 75 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,760 to 7,630 feet

*Mean annual precipitation:* 12 to 16 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Rubble land**

*Composition:* 40 percent

*Definition:* Rock outcroppings of strongly indurated quartz monzonite and fine-grained aplites of the Boulder Batholith along with associated rubbly colluvial slopes

#### **Stecum and similar soils**

*Composition:* 20 percent

*Geomorphic description:*

- Mountainside
- Ridge

*Slope:* 35 to 75 percent

*Elevation:* 5,760 to 7,630 feet

*Effective annual precipitation:* 12 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very stony loamy coarse sand

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 24 to 48 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 1.2 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

A—1 to 7 inches; very stony loamy coarse sand

BC—7 to 25 inches; very stony coarse sand

Cr—25 to 38 inches; bedrock

R—38 to 48 inches; bedrock

#### **Zonite, moist and similar soils**

*Composition:* 20 percent

*Geomorphic description:*

- Mountainside
- Ridge

*Slope:* 35 to 75 percent

*Elevation:* 5,760 to 7,630 feet

*Effective annual precipitation:* 12 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very gravelly loamy coarse sand

*Depth to restrictive feature:* Lithic bedrock: 4 to 10 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 0.4 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

A—1 to 4 inches; very gravelly loamy coarse sand

BC—4 to 9 inches; very gravelly loamy coarse sand

R—9 to 19 inches; bedrock

#### **Additional Components**

Dinnen and similar soils: 10 percent

Rock outcrop: 10 percent

### **369E—Rubick, bouldery-Comad, very bouldery complex, 8 to 30 percent slopes**

#### **Map Unit Setting**

*Interpretive focus:* Forestland

*Elevation:* 5,900 to 7,360 feet

*Mean annual precipitation:* 16 to 18 inches

*Frost-free period:* 30 to 50 days

#### **Component Description**

##### **Rubick, bouldery and similar soils**

*Composition:* 45 percent

*Geomorphic description:* Nose slope backslope on mountain

*Slope:* 15 to 30 percent, east to west aspects

*Elevation:* 5,910 to 7,370 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Gravelly sandy loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent boulders, 100 to 166 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Somewhat excessively drained

*Parent material:* Very stony colluvium derived from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 3.4 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

Oe—2 to 3 inches; moderately decomposed plant material

E—3 to 21 inches; gravelly sandy loam

Bw—21 to 37 inches; very stony coarse sandy loam

BC—37 to 60 inches; very stony loamy coarse sand

##### **Comad, very bouldery and similar soils**

*Composition:* 35 percent

*Geomorphic description:*

- Nose slope shoulder on mountain
- Footslope on ridge

*Slope:* 8 to 30 percent, east to west aspects

*Elevation:* 5,910 to 7,370 feet  
*Effective annual precipitation:* 15 to 17 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Very gravelly coarse sandy loam  
*Rock fragments on the soil surface:* 0.20 to 3.00 percent boulders, 20 to 67 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Excessively drained  
*Parent material:* Colluvium derived from granite  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 2.3 inches  
*Typical profile:*  
    Oi—0 to 2 inches; slightly decomposed plant material  
    E—2 to 8 inches; very gravelly coarse sandy loam  
    E and Bt—8 to 26 inches; very gravelly loamy coarse sand  
    C—26 to 60 inches; very gravelly coarse sand

#### **Additional Components**

Basincreek and similar soils: 10 percent  
Rock outcrop: 10 percent

### **370C—Comad-Bobowic complex, 2 to 8 percent slopes, bouldery**

#### **Map Unit Setting**

*Interpretive focus:* Forestland  
*Elevation:* 5,540 to 5,870 feet  
*Mean annual precipitation:* 17 to 19 inches  
*Frost-free period:* 30 to 50 days

#### **Component Description**

##### **Comad, bouldery and similar soils**

*Composition:* 50 percent  
*Geomorphic description:* Foothills on north-facing mountain  
*Slope:* 4 to 8 percent, west to east aspects  
*Elevation:* 5,540 to 5,870 feet  
*Effective annual precipitation:* 19 to 22 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Coarse sandy loam  
*Rock fragments on the soil surface:* 0.01 to 0.10 percent boulders, 100 to 166 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Excessively drained  
*Parent material:* Colluvium derived from granite  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 2.3 inches  
*Typical profile:*  
    Oi—0 to 2 inches; slightly decomposed plant material  
    E—2 to 8 inches; coarse sandy loam  
    E and Bt—8 to 26 inches; very gravelly loamy coarse sand  
    C—26 to 60 inches; very gravelly coarse sand

**Bobowic, bouldery and similar soils**

*Composition:* 35 percent

*Geomorphic description:*

- Toeslope on north-facing mountain
- Foothlope on swale

*Slope:* 2 to 6 percent, west to east aspects

*Elevation:* 5,540 to 5,870 feet

*Effective annual precipitation:* 19 to 22 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Coarse sandy loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent boulders, 100 to 166 feet apart

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 22 to 48 inches

*Drainage class:* Well drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 2.1 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

E—1 to 11 inches; coarse sandy loam

Bw—11 to 21 inches; gravelly coarse sandy loam

BC—21 to 29 inches; very gravelly loamy coarse sand

Cr—29 to 34 inches; bedrock

R—34 to 60 inches; bedrock

**Additional Components**

Comad, very bouldery and similar soils: 13 percent

Rock outcrop: 2 percent

**371G—Stecum-Rock outcrop-Comad complex, 35 to 70 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Forestland

*Elevation:* 5,380 to 7,960 feet

*Mean annual precipitation:* 19 to 24 inches

*Frost-free period:* 30 to 50 days

**Component Description**

**Stecum and similar soils**

*Composition:* 40 percent

*Geomorphic description:* Mountainflank on mountain

*Slope:* 35 to 70 percent

*Elevation:* 5,380 to 7,960 feet

*Effective annual precipitation:* 19 to 24 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Very stony loamy coarse sand

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 24 to 48 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 1.2 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

A—1 to 7 inches; very stony loamy coarse sand

BC—7 to 25 inches; very stony coarse sand

Cr—25 to 38 inches; bedrock

R—38 to 60 inches; bedrock

**Rock outcrop**

*Composition:* 30 percent

*Geomorphic description:* None assigned

*Definition:* Strongly indurated quartz monzonite of the Boulder Batholith

**Comad and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Mountainflank on mountain

*Slope:* 35 to 70 percent

*Elevation:* 5,380 to 7,960 feet

*Effective annual precipitation:* 19 to 24 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Very stony loamy coarse sand

*Depth to restrictive feature:* None noted

*Drainage class:* Excessively drained

*Parent material:* Colluvium derived from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 2.1 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

E—2 to 8 inches; very stony loamy coarse sand

E and Bt—8 to 26 inches; very stony loamy coarse sand

C—26 to 60 inches; extremely stony sand

**Additional Components**

Goldflint and similar soils: 13 percent

Peeler and similar soils: 2 percent

**372E—Basincreek-Peeler-Stecum complex, 15 to 45 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Forestland

*Elevation:* 5,640 to 7,330 feet

*Mean annual precipitation:* 15 to 17 inches

*Frost-free period:* 30 to 50 days

## Component Description

### **Basincreek and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Side slope on mountain

*Slope:* 15 to 45 percent, west to southeast aspects

*Elevation:* 5,640 to 7,330 feet

*Effective annual precipitation:* 16 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Gravelly coarse sandy loam

*Depth to restrictive feature:* Lithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Colluvium over residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 3.7 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

E—2 to 18 inches; gravelly coarse sandy loam

E and Bw—18 to 38 inches; gravelly coarse sandy loam

BC—38 to 46 inches; very gravelly sand

R—46 to 60 inches; bedrock

### **Peeler, sandy substratum and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Side slope on mountain

*Slope:* 25 to 45 percent, west to southeast aspects

*Elevation:* 5,640 to 7,330 feet

*Effective annual precipitation:* 16 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Gravelly coarse sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 4.3 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

Oe—1 to 2 inches; moderately decomposed plant material

E—2 to 14 inches; gravelly coarse sandy loam

E/Bt—14 to 24 inches; gravelly coarse sandy loam

Bt—24 to 38 inches; gravelly sandy clay loam

BC—38 to 60 inches; very gravelly loamy coarse sand

### **Stecum and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Nose slope on mountain

*Slope:* 15 to 45 percent, west to southeast aspects

*Elevation:* 5,640 to 7,330 feet

*Effective annual precipitation:* 16 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Gravelly loamy coarse sand

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 24 to 48 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 1.2 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

A—1 to 7 inches; gravelly loamy coarse sand

BC—7 to 25 inches; very stony coarse sand

Cr—25 to 38 inches; bedrock

R—38 to 48 inches; bedrock

### **Additional Components**

Bobowic and similar soils: 10 percent

Peeler and similar soils: 10 percent

Comad and similar soils: 8 percent

Rock outcrop: 5 percent

Wissikihon and similar soils: 2 percent

## **373E—Hiore-Caseypeak-Rock outcrop complex, 15 to 45 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Forestland

*Elevation:* 5,870 to 7,040 feet

*Mean annual precipitation:* 17 to 19 inches

*Frost-free period:* 30 to 70 days

### **Component Description**

#### **Hiore and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Side slope on south-tending hillside

*Slope:* 15 to 45 percent, east to northwest aspects

*Elevation:* 5,870 to 7,040 feet

*Effective annual precipitation:* 15 to 18 inches

*Frost-free period:* 30 to 70 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 3.1 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

A—2 to 14 inches; sandy loam

Bw—14 to 29 inches; very gravelly coarse sandy loam

BC—29 to 60 inches; very gravelly loamy coarse sand

**Caseypeak and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Nose slope on south-tending hillside

*Slope:* 15 to 45 percent, east to northwest aspects

*Elevation:* 5,870 to 7,040 feet

*Effective annual precipitation:* 15 to 18 inches

*Frost-free period:* 30 to 70 days

*Surface layer texture:* Gravelly coarse sandy loam

*Depth to restrictive feature:*

- Paralithic bedrock: 10 to 20 inches
- Lithic bedrock: 12 to 24 inches

*Drainage class:* Well drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 0.9 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

A—1 to 7 inches; gravelly coarse sandy loam

Bw—7 to 14 inches; very gravelly coarse sandy loam

Cr—14 to 19 inches; bedrock

R—19 to 60 inches; bedrock

**Rock outcrop**

*Composition:* 15 percent

*Definition:* Moderately to strongly indurated quartz monzonite of the Boulder Batholith

**Additional Components**

Branham and similar soils: 10 percent

Highrye and similar soils: 10 percent

Zonite and similar soils: 10 percent

**374B—Valleyflat sandy loam, 1 to 4 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,450 to 5,900 feet

*Mean annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

**Component Description**

**Valleyflat and similar soils**

*Composition:* 85 percent

*Geomorphic description:* Alluvial fan

*Slope:* 1 to 4 percent

*Elevation:* 5,450 to 5,910 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium derived from granite

*Native plant cover type:* Rangeland



*Flooding:* None

*Available water capacity:* Mainly 2.6 inches

*Typical profile:*

A1—0 to 2 inches; sandy loam

A2—2 to 5 inches; sandy loam

Bw—5 to 10 inches; coarse sandy loam

2C—10 to 72 inches; stratified gravelly coarse sand to very gravelly coarse sand

### **Additional Components**

Rockerjohn and similar soils: 8 percent

Pitchstone and similar soils: 5 percent

Valleyflat, greater slopes and similar soils: 2 percent

## **375E—Valleyflat-Pitchstone complex, 8 to 30 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,130 to 5,720 feet

*Mean annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Valleyflat and similar soils**

*Composition:* 60 percent

*Geomorphic description:*

- Nose slope on escarpment
- Side slope on escarpment

*Slope:* 8 to 30 percent, northeast to northwest aspects

*Elevation:* 5,130 to 5,720 feet

*Effective annual precipitation:* 10 to 13 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Coarse sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium derived from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 2.6 inches

*Typical profile:*

A1—0 to 2 inches; coarse sandy loam

A2—2 to 5 inches; sandy loam

Bw—5 to 10 inches; coarse sandy loam

2C—10 to 72 inches; stratified gravelly coarse sand to very gravelly coarse sand

#### **Pitchstone and similar soils**

*Composition:* 25 percent

*Geomorphic description:* Base slope on escarpment

*Slope:* 8 to 20 percent

*Elevation:* 5,130 to 5,720 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Gravelly coarse sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium derived from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.8 inches

*Typical profile:*

A—0 to 9 inches; gravelly coarse sandy loam

Bw—9 to 21 inches; coarse sandy loam

BC—21 to 31 inches; gravelly coarse sandy loam

C—31 to 60 inches; gravelly coarse sand

### **Additional Components**

Valleyflat, thin surface and similar soils: 5 percent

Wissikihon and similar soils: 5 percent

Valleyflat, lesser slopes and similar soils: 4 percent

Riverwash: 1 percent

## **376A—Cometcrik, rarely flooded-Histic Endoaquolls, rarely flooded-Passmore, very rarely flooded complex, 0 to 4 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Riparian

*Elevation:* 5,460 to 5,720 feet

*Mean annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Cometcrik and similar soils**

*Composition:* 50 percent

*Geomorphic description:* Flood plain

*Slope:* 1 to 2 percent

*Elevation:* 5,460 to 5,720 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Mucky peat

*Depth to restrictive feature:* None noted

*Drainage class:* Poorly drained

*Parent material:* Mixed alluvium

*Native plant cover type:* Rangeland

*Flooding:* Rare

*Water table:* Present

*Available water capacity:* Mainly 7.7 inches

*Typical profile:*

Oe—0 to 3 inches; mucky peat

A1—3 to 9 inches; loam

A2—9 to 24 inches; loam

Cg—24 to 46 inches; stratified coarse sandy loam to loam to silt loam

2Cg—46 to 72 inches; gravelly coarse sand

**Histic Endoaquolls and similar soils**

*Composition:* 25 percent

*Geomorphic description:* Flood plain

*Slope:* 0 to 2 percent

*Elevation:* 5,460 to 5,720 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Mucky peat

*Depth to restrictive feature:* None noted

*Drainage class:* Very poorly drained

*Parent material:* Herbaceous organic material over stratified loamy or loamy over sandy alluvium

*Native plant cover type:* Rangeland

*Flooding:* Rare

*Water table:* Present

*Available water capacity:* Mainly 7.2 inches

*Typical profile:*

Oe—0 to 10 inches; mucky peat

A—10 to 32 inches; silt loam

Bg—32 to 48 inches; loam

2Cg—48 to 72 inches; very gravelly coarse sand

**Passmore and similar soils**

*Composition:* 25 percent

*Geomorphic description:* Upper fringe of flood plain

*Slope:* 1 to 4 percent

*Elevation:* 5,460 to 5,720 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Mucky peat

*Depth to restrictive feature:* None noted

*Drainage class:* Somewhat poorly drained

*Parent material:* Loamy alluvium over alluvium derived from granite

*Native plant cover type:* Rangeland

*Flooding:* Very rare

*Water table:* Present

*Available water capacity:* Mainly 5.8 inches

*Typical profile:*

Oe—0 to 2 inches; mucky peat

A—2 to 16 inches; loam

Bw—16 to 32 inches; sandy loam

2C—32 to 72 inches; gravelly coarse sand

**377B—Valleyflat-Pitchstone complex, 1 to 4 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,460 to 5,740 feet

*Mean annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

### Component Description

#### **Valleyflat and similar soils**

*Composition:* 45 percent

*Geomorphic description:* Tread on terrace

*Slope:* 1 to 4 percent

*Elevation:* 5,460 to 5,740 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium derived from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 2.6 inches

*Typical profile:*

A1—0 to 2 inches; sandy loam

A2—2 to 5 inches; sandy loam

Bw—5 to 10 inches; coarse sandy loam

2C—10 to 72 inches; stratified gravelly coarse sand to very gravelly coarse sand

#### **Pitchstone and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Tread on terrace

*Slope:* 2 to 4 percent

*Elevation:* 5,460 to 5,740 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium derived from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.8 inches

*Typical profile:*

A—0 to 9 inches; sandy loam

Bw—9 to 21 inches; coarse sandy loam

BC—21 to 31 inches; gravelly coarse sandy loam

C—31 to 60 inches; gravelly coarse sand

### Additional Components

Pitchstone, sandy substratum and similar soils: 10 percent

Rockerjohn and similar soils: 5 percent

Valleyflat, greater slopes and similar soils: 5 percent

## **378C—Valleyflat-Pitchstone complex, 4 to 8 percent slopes**

### Map Unit Setting

*Interpretive focus:* Rangeland

*Elevation:* 5,180 to 5,810 feet

*Mean annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Valleyflat and similar soils**

*Composition:* 70 percent

*Geomorphic description:* Alluvial fan

*Slope:* 4 to 8 percent

*Elevation:* 5,180 to 5,810 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium derived from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 2.6 inches

*Typical profile:*

A1—0 to 2 inches; sandy loam

A2—2 to 5 inches; sandy loam

Bw—5 to 10 inches; coarse sandy loam

2C—10 to 72 inches; stratified gravelly coarse sand to very gravelly coarse sand

#### **Pitchstone and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Alluvial fan

*Slope:* 4 to 8 percent

*Elevation:* 5,180 to 5,810 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium derived from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.8 inches

*Typical profile:*

A—0 to 9 inches; sandy loam

Bw—9 to 21 inches; coarse sandy loam

BC—21 to 31 inches; gravelly coarse sandy loam

C—31 to 60 inches; gravelly coarse sand

### **Additional Components**

Valleyflat, greater slopes and similar soils: 8 percent

Rockerjohn and similar soils: 2 percent

## **379F—Pitchstone-Rockerjohn complex, 15 to 50 percent slopes, extremely bouldery**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,410 to 6,970 feet

*Mean annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Pitchstone, extremely bouldery and similar soils**

*Composition:* 45 percent

*Geomorphic description:* Backslope on mountain

*Slope:* 25 to 50 percent

*Elevation:* 5,410 to 6,970 feet

*Effective annual precipitation:* 10 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Gravelly loamy sand

*Rock fragments on the soil surface:* 3 to 15 percent boulders, 10 to 33 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium derived from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 6.1 inches

*Typical profile:*

A—0 to 9 inches; gravelly loamy sand

Bw—9 to 21 inches; coarse sandy loam

BC—21 to 31 inches; gravelly coarse sandy loam

C—31 to 60 inches; stratified sand to loamy coarse sand to loamy sand

#### **Rockerjohn, extremely bouldery and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Footslope on mountain

*Slope:* 15 to 30 percent

*Elevation:* 5,410 to 6,970 feet

*Effective annual precipitation:* 10 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Very stony coarse sand

*Rock fragments on the soil surface:* 3 to 15 percent boulders, 10 to 33 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium derived from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 6.0 inches

*Typical profile:*

A—0 to 6 inches; very stony coarse sand

Bw—6 to 15 inches; coarse sandy loam

BC—15 to 45 inches; gravelly coarse sand

2C—45 to 60 inches; sandy loam

### **Additional Components**

Modess, very bouldery and similar soils: 12 percent  
Rock outcrop: 8 percent

## **380D—Beeftrail-Dinnen-Rock outcrop complex, 4 to 15 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,230 to 6,450 feet  
*Mean annual precipitation:* 14 to 16 inches  
*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Beeftrail and similar soils**

*Composition:* 35 percent  
*Geomorphic description:* Side slope on hill  
*Slope:* 4 to 15 percent  
*Elevation:* 5,230 to 6,450 feet  
*Effective annual precipitation:* 14 to 16 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Coarse sandy loam  
*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 28 to 56 inches

*Drainage class:* Somewhat excessively drained  
*Parent material:* Residuum weathered from granite  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 2.2 inches  
*Typical profile:*

- A—0 to 7 inches; coarse sandy loam
- Bw—7 to 14 inches; gravelly coarse sandy loam
- BC—14 to 26 inches; gravelly loamy coarse sand
- Cr—26 to 35 inches; bedrock
- R—35 to 45 inches; bedrock

#### **Dinnen and similar soils**

*Composition:* 25 percent  
*Geomorphic description:* Side slope on hill  
*Slope:* 8 to 15 percent  
*Elevation:* 5,230 to 6,450 feet  
*Effective annual precipitation:* 14 to 16 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Sandy loam  
*Depth to restrictive feature:* Paralithic bedrock: Greater than 53 inches  
*Drainage class:* Well drained  
*Parent material:* Colluvium derived from granite over residuum weathered from granite  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 6.4 inches

*Typical profile:*

- A—0 to 9 inches; sandy loam
- Bw—9 to 21 inches; gravelly coarse sandy loam
- BC—21 to 41 inches; gravelly coarse sandy loam
- C—41 to 53 inches; gravelly loamy coarse sand
- Cr—53 to 60 inches; bedrock

**Rock outcrop**

*Composition:* 12 percent

*Definition:* Moderately to strongly indurated quartz monzonite of the Boulder Batholith with dikes of very strongly indurated, finer-grained aplites

**Additional Components**

- Highrye and similar soils: 10 percent
- Zonite and similar soils: 10 percent
- Minestope and similar soils: 5 percent
- Bavdark and similar soils: 3 percent

**382B—Varney-Anaconda-Varney, sandy substratum complex, 1 to 4 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,490 to 5,690 feet

*Mean annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

**Component Description**

**Varney and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Alluvial fan

*Slope:* 1 to 4 percent

*Elevation:* 5,500 to 5,690 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Sandy clay loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium derived from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 7.6 inches

*Typical profile:*

- A—0 to 6 inches; sandy clay loam
- Bt—6 to 18 inches; sandy clay loam
- Bk—18 to 36 inches; sandy loam
- C—36 to 60 inches; sandy loam

**Anaconda and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Alluvial fan

*Slope:* 1 to 4 percent



*Elevation:* 5,500 to 5,690 feet  
*Effective annual precipitation:* 12 to 14 inches  
*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Sandy loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Alluvium derived from granite  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 9.1 inches  
*Typical profile:*  
A—0 to 8 inches; sandy loam  
Bw—8 to 17 inches; sandy loam  
Bk—17 to 36 inches; coarse sandy loam  
BC—36 to 60 inches; loam

**Varney, sandy substratum and similar soils**

*Composition:* 20 percent  
*Geomorphic description:* Alluvial fan  
*Slope:* 1 to 4 percent  
*Elevation:* 5,500 to 5,690 feet  
*Effective annual precipitation:* 12 to 14 inches  
*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Sandy loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Alluvium derived from granite  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 5.9 inches  
*Typical profile:*  
A—0 to 6 inches; sandy loam  
Bt—6 to 18 inches; sandy clay loam  
Bk—18 to 36 inches; sandy loam  
C—36 to 60 inches; gravelly loamy coarse sand

**Additional Components**

Valleyflat and similar soils: 10 percent  
Anaconda, greater slopes and similar soils: 3 percent  
Pitchstone and similar soils: 1 percent  
Valleyflat, greater slopes and similar soils: 1 percent

**383C—Highrye-Beeftrail-Oro Fino complex, 1 to 8 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,590 to 6,360 feet  
*Mean annual precipitation:* 15 to 17 inches  
*Frost-free period:* 50 to 70 days

## Component Description

### Highrye and similar soils

*Composition:* 40 percent

*Geomorphic description:* Pediment

*Slope:* 2 to 8 percent

*Elevation:* 5,590 to 6,360 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly sandy clay loam

*Depth to restrictive feature:* Paralithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Colluvium derived from granite over residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.3 inches

*Typical profile:*

- A—0 to 11 inches; gravelly sandy clay loam
- Bt—11 to 32 inches; gravelly sandy clay loam
- BC—32 to 46 inches; gravelly coarse sandy loam
- C—46 to 56 inches; very gravelly coarse sand
- Cr—56 to 60 inches; bedrock

### Beeftrail and similar soils

*Composition:* 30 percent

*Geomorphic description:* Pediment

*Slope:* 4 to 8 percent

*Elevation:* 5,590 to 6,360 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Coarse sandy loam

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 28 to 56 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 2.2 inches

*Typical profile:*

- A—0 to 7 inches; coarse sandy loam
- Bw—7 to 14 inches; gravelly coarse sandy loam
- BC—14 to 26 inches; gravelly loamy coarse sand
- Cr—26 to 35 inches; bedrock
- R—35 to 45 inches; bedrock

### Oro Fino and similar soils

*Composition:* 15 percent

*Geomorphic description:* Pediment

*Slope:* 1 to 4 percent

*Elevation:* 5,590 to 6,360 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Sandy clay loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Local alluvium derived from granite and/or colluvium derived from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 8.4 inches

*Typical profile:*

A—0 to 6 inches; sandy clay loam

Bt—6 to 20 inches; gravelly sandy clay loam

Bk—20 to 38 inches; loam

C—38 to 60 inches; sandy loam

### **Additional Components**

Zonite and similar soils: 7 percent

Beeftrail, greater slopes and similar soils: 5 percent

Rock outcrop: 3 percent

## **384E—Minestope, extremely bouldery-Branham, extremely bouldery-Rock outcrop complex, 8 to 35 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,400 to 6,810 feet

*Mean annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Minestope, extremely bouldery and similar soils**

*Composition:* 45 percent

*Geomorphic description:* Side slope on generally south-facing hill

*Slope:* 8 to 35 percent, east to northwest aspects

*Elevation:* 5,400 to 6,810 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly coarse sandy loam

*Rock fragments on the soil surface:* 3 to 25 percent boulders, 10 to 33 feet apart

*Depth to restrictive feature:*

- Paralithic bedrock: 10 to 20 inches
- Lithic bedrock: 20 to 40 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.3 inches

*Typical profile:*

A—0 to 6 inches; gravelly coarse sandy loam

Bw—6 to 11 inches; gravelly coarse sandy loam

BC—11 to 17 inches; very gravelly loamy coarse sand

Cr—17 to 26 inches; bedrock

R—26 to 36 inches; bedrock

**Branham, extremely bouldery and similar soils**

*Composition:* 25 percent

*Geomorphic description:* Side slope on generally south-facing hill

*Slope:* 15 to 35 percent, east to northwest aspects

*Elevation:* 5,400 to 6,810 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Coarse sandy loam

*Rock fragments on the soil surface:* 3 to 25 percent boulders, 10 to 33 feet apart

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 24 to 56 inches

*Drainage class:* Well drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.1 inches

*Typical profile:*

A—0 to 7 inches; coarse sandy loam

Bw—7 to 17 inches; gravelly coarse sandy loam

BC—17 to 26 inches; gravelly coarse sandy loam

Cr—26 to 34 inches; bedrock

R—34 to 44 inches; bedrock

**Rock outcrop**

*Composition:* 15 percent

*Definition:* Moderately to strongly indurated quartz monzonite of the Boulder Batholith, often containing dikes of very strongly indurated, finer-grained aplites

**Additional Components**

Highrye, very bouldery and similar soils: 9 percent

Fleecer, very bouldery and similar soils: 5 percent

Bavdark, very stony and similar soils: 1 percent

**385D—Highrye-Beeftrail complex, 4 to 15 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,630 to 6,840 feet

*Mean annual precipitation:* 17 to 19 inches

*Frost-free period:* 50 to 70 days

**Component Description**

**Highrye and similar soils**

*Composition:* 50 percent

*Geomorphic description:*

- Interfluvium on hill
- Ridge

*Slope:* 4 to 15 percent

*Elevation:* 5,630 to 6,840 feet

*Effective annual precipitation:* 17 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly sandy clay loam

*Depth to restrictive feature:* Paralithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Colluvium derived from granite over residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.3 inches

*Typical profile:*

A—0 to 11 inches; gravelly sandy clay loam

Bt—11 to 32 inches; gravelly sandy clay loam

BC—32 to 46 inches; gravelly coarse sandy loam

C—46 to 56 inches; very gravelly coarse sand

Cr—56 to 60 inches; bedrock

### **Beeftrail and similar soils**

*Composition:* 25 percent

*Geomorphic description:*

- Side slope on hill
- Ridge

*Slope:* 8 to 15 percent

*Elevation:* 5,630 to 6,840 feet

*Effective annual precipitation:* 17 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 28 to 56 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 2.1 inches

*Typical profile:*

A—0 to 7 inches; sandy loam

Bw—7 to 14 inches; gravelly coarse sandy loam

BC—14 to 26 inches; gravelly loamy coarse sand

Cr—26 to 35 inches; bedrock

R—35 to 45 inches; bedrock

### **Additional Components**

Fleecer and similar soils: 10 percent

Highrye, greater slopes and similar soils: 8 percent

Zonite and similar soils: 5 percent

Rock outcrop: 2 percent

## **386D—Varney-Con complex, 8 to 15 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Field investigation intensity:* Order 2

*Elevation:* 4,000 to 5,710 feet

*Mean annual precipitation:* 10 to 14 inches

*Frost-free period:* 70 to 100 days

## Component Description

### **Varney and similar soils**

*Composition:* 60 percent

*Geomorphic description:*

- Alluvial fan
- Stream terrace

*Slope:* 8 to 15 percent

*Elevation:* 4,000 to 5,710 feet

*Effective annual precipitation:* 10 to 14 inches

*Frost-free period:* 70 to 100 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 7.0 inches

*Typical profile:*

- Ap—0 to 8 inches; loam
- Bt—8 to 14 inches; gravelly clay loam
- Bk1—14 to 23 inches; gravelly sandy loam
- Bk2—23 to 60 inches; stratified gravelly loamy sand to loam

### **Con and similar soils**

*Composition:* 25 percent

*Geomorphic description:*

- Alluvial fan
- Stream terrace

*Slope:* 8 to 15 percent

*Elevation:* 4,000 to 5,710 feet

*Effective annual precipitation:* 10 to 14 inches

*Frost-free period:* 70 to 100 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Calcareous alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 8.8 inches

*Typical profile:*

- Ap—0 to 7 inches; loam
- Bw—7 to 11 inches; clay loam
- Bk1—11 to 34 inches; loam
- Bk2—34 to 60 inches; gravelly loam

## Additional Components

Varney, clay loam and similar soils: 10 percent

Con, cobbly clay loam and similar soils: 5 percent

## **389C—Anaconda-Rockerjohn complex, 1 to 8 percent slopes, moderately impacted**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 4,950 to 5,770 feet

*Mean annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Anaconda, moderately impacted and similar soils**

*Composition:* 55 percent

*Geomorphic description:* Upper part of alluvial fan

*Slope:* 1 to 8 percent

*Elevation:* 4,950 to 5,770 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium derived from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 9.1 inches

*Typical profile:*

A1—0 to 0 inches; sandy loam

A2—0 to 8 inches; sandy loam

Bw—8 to 17 inches; sandy loam

Bk—17 to 36 inches; coarse sandy loam

BC—36 to 60 inches; loam

#### **Rockerjohn, moderately impacted and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Lower part of alluvial fan

*Slope:* 1 to 8 percent

*Elevation:* 4,950 to 5,770 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Coarse sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium derived from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 6.0 inches

*Typical profile:*

A1—0 to 0 inches; coarse sandy loam

A2—0 to 6 inches; coarse sandy loam

Bw—6 to 15 inches; coarse sandy loam

BC—15 to 45 inches; gravelly coarse sand

2C—45 to 60 inches; sandy loam

### **Additional Components**

Valleyflat, moderately impacted and similar soils: 10 percent

Valleyflat, greater slopes, moderately impacted and similar soils: 3 percent

Riverwash: 2 percent

## **390D—Rockerjohn-Valleyflat complex, 4 to 20 percent slopes, very stony, moderately impacted**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,120 to 5,970 feet

*Mean annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Rockerjohn, moderately impacted, very stony and similar soils**

*Composition:* 50 percent

*Geomorphic description:* Backslope on hill

*Slope:* 8 to 20 percent

*Elevation:* 5,120 to 5,970 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Coarse sandy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 10 to 33 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium derived from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 6.0 inches

*Typical profile:*

A1—0 to 0 inches; coarse sandy loam

A2—0 to 6 inches; coarse sandy loam

Bw—6 to 15 inches; coarse sandy loam

BC—15 to 45 inches; gravelly coarse sand

2C—45 to 60 inches; sandy loam

#### **Valleyflat, moderately impacted, very stony and similar soils**

*Composition:* 35 percent

*Geomorphic description:*

- Footslope on hill
- Swale

*Slope:* 4 to 15 percent

*Elevation:* 5,120 to 5,970 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Coarse sandy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 10 to 33 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium derived from granite

*Native plant cover type:* Rangeland



*Flooding:* None

*Available water capacity:* Mainly 2.6 inches

*Typical profile:*

A1—0 to 0 inches; coarse sandy loam

A2—0 to 2 inches; coarse sandy loam

A3—2 to 5 inches; sandy loam

Bw—5 to 10 inches; coarse sandy loam

2C—10 to 72 inches; stratified gravelly coarse sand to very gravelly coarse sand

### **Additional Components**

Anaconda, moderately impacted and similar soils: 10 percent

Valleyflat, lesser slopes, moderately impacted and similar soils: 5 percent

## **392F—Bobowic, very bouldery-Comad, very bouldery- Rock outcrop complex, 20 to 50 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Forestland

*Elevation:* 5,300 to 7,480 feet

*Mean annual precipitation:* 15 to 17 inches

*Frost-free period:* 30 to 50 days

### **Component Description**

#### **Bobowic, very bouldery and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Side slope on mountain

*Slope:* 20 to 50 percent, west to east aspects

*Elevation:* 5,300 to 7,480 feet

*Effective annual precipitation:* 16 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Coarse sandy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent boulders, 20 to 77 feet apart

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 22 to 48 inches

*Drainage class:* Well drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 2.1 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

E—1 to 11 inches; coarse sandy loam

Bw—11 to 21 inches; gravelly coarse sandy loam

BC—21 to 29 inches; very gravelly loamy coarse sand

Cr—29 to 34 inches; bedrock

R—34 to 60 inches; bedrock

#### **Comad, very bouldery and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Head slope on mountain

*Slope:* 20 to 45 percent, west to east aspects

*Elevation:* 5,300 to 7,480 feet

*Effective annual precipitation:* 16 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Gravelly coarse sandy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent boulders, 20 to 77 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Excessively drained

*Parent material:* Colluvium derived from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 2.3 inches

*Typical profile:*

    Oi—0 to 2 inches; slightly decomposed plant material

    E—2 to 8 inches; gravelly coarse sandy loam

    E and Bt—8 to 26 inches; very gravelly loamy coarse sand

    C—26 to 60 inches; very gravelly coarse sand

### **Rock outcrop**

*Composition:* 15 percent

*Definition:* Moderately to strongly indurated quartz monzonite of the Boulder Batholith

### **Additional Components**

Goldflint, bouldery and similar soils: 10 percent

Stecum and similar soils: 10 percent

Comad, stony coarse sandy loam and similar soils: 5 percent

Hiore and similar soils: 5 percent

## **394E—Minestope, very stony-Beeftrail, very stony-Rock outcrop complex, 8 to 30 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland and forestland

*Elevation:* 5,220 to 6,300 feet

*Mean annual precipitation:* 13 to 17 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Minestope, very stony and similar soils**

*Composition:* 40 percent

*Geomorphic description:* Side slope on south-tending hill

*Slope:* 8 to 30 percent, east to west aspects

*Elevation:* 5,220 to 6,300 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly coarse sandy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 10 to 40 feet apart

*Depth to restrictive feature:*

- Paralithic bedrock: 10 to 20 inches
- Lithic bedrock: 20 to 40 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.3 inches

*Typical profile:*

A—0 to 6 inches; gravelly coarse sandy loam

Bw—6 to 11 inches; gravelly coarse sandy loam

BC—11 to 17 inches; very gravelly loamy coarse sand

Cr—17 to 26 inches; bedrock

R—26 to 36 inches; bedrock

**Beeftrail, very stony and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Side slope on south-tending hill

*Slope:* 8 to 30 percent, east to west aspects

*Elevation:* 5,220 to 6,300 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly coarse sandy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 10 to 40 feet apart

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 28 to 56 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 2.1 inches

*Typical profile:*

A—0 to 7 inches; gravelly coarse sandy loam

Bw—7 to 14 inches; gravelly coarse sandy loam

BC—14 to 26 inches; gravelly loamy coarse sand

Cr—26 to 35 inches; bedrock

R—35 to 45 inches; bedrock

**Rock outcrop**

*Composition:* 15 percent

*Definition:* Moderately to strongly indurated quartz monzonite of the Boulder Batholith

**Additional Components**

Minestope, very stony, cool and similar soils: 10 percent

Zonite, extremely stony and similar soils: 5 percent

**395E—Beeftrail-Stecum-Wissikihon complex, 8 to 25 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,410 to 7,610 feet

*Mean annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

**Component Description**

**Beeftrail and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Side slope on hill

*Slope:* 8 to 25 percent

*Elevation:* 5,410 to 7,610 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Coarse sandy loam

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 28 to 56 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 2.2 inches

*Typical profile:*

A—0 to 7 inches; coarse sandy loam

Bw—7 to 14 inches; gravelly coarse sandy loam

BC—14 to 26 inches; gravelly loamy coarse sand

Cr—26 to 35 inches; bedrock

R—35 to 45 inches; bedrock

#### **Stecum and similar soils**

*Composition:* 25 percent

*Geomorphic description:* Nose slope on hill

*Slope:* 8 to 25 percent

*Elevation:* 5,410 to 7,610 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Stony loamy coarse sand

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 24 to 48 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 1.2 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

A—1 to 7 inches; stony loamy coarse sand

BC—7 to 25 inches; very stony coarse sand

Cr—25 to 38 inches; bedrock

R—38 to 48 inches; bedrock

#### **Wissikihon and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Base slope on hill

*Slope:* 15 to 25 percent

*Elevation:* 5,410 to 7,610 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Coarse sandy loam

*Depth to restrictive feature:* Paralithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Colluvium derived from granite over residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.0 inches

*Typical profile:*

A—0 to 8 inches; coarse sandy loam

Bw—8 to 16 inches; gravelly coarse sandy loam

BC—16 to 48 inches; gravelly loamy coarse sand

Cr—48 to 60 inches; bedrock

### **Additional Components**

Minestope and similar soils: 10 percent

Rock outcrop: 10 percent

Basincreek and similar soils: 5 percent

## **397E—Anaconda, sandy substratum-Anaconda-Valleyflat complex, 8 to 45 percent slopes, moderately impacted**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 4,970 to 5,450 feet

*Mean annual precipitation:* 10 to 14 inches

*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Anaconda, moderately impacted, sandy substratum and similar soils**

*Composition:* 45 percent

*Geomorphic description:*

- Side slope on escarpment
- Nose slope on escarpment

*Slope:* 8 to 45 percent, east to west aspects

*Elevation:* 4,970 to 5,450 feet

*Effective annual precipitation:* 8 to 12 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Cobbly sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium derived from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 7.0 inches

*Typical profile:*

A1—0 to 0 inches; cobbly sandy loam

A2—0 to 8 inches; cobbly sandy loam

Bw—8 to 17 inches; sandy loam

Bk—17 to 36 inches; coarse sandy loam

BC—36 to 60 inches; loamy sand

#### **Anaconda, moderately impacted and similar soils**

*Composition:* 25 percent

*Geomorphic description:* Side slope on escarpment

*Slope:* 15 to 45 percent, east to west aspects

*Elevation:* 4,970 to 5,450 feet

*Effective annual precipitation:* 8 to 12 inches

*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Cobbly sandy loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Alluvium derived from granite  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 9.1 inches  
*Typical profile:*

A1—0 to 0 inches; cobbly sandy loam  
A2—0 to 8 inches; cobbly sandy loam  
Bw—8 to 17 inches; sandy loam  
Bk—17 to 36 inches; coarse sandy loam  
BC—36 to 60 inches; loam

**Valleyflat, moderately impacted and similar soils**

*Composition:* 20 percent  
*Geomorphic description:* Base slope on escarpment  
*Slope:* 8 to 15 percent, east to west aspects  
*Elevation:* 4,970 to 5,450 feet  
*Effective annual precipitation:* 8 to 12 inches  
*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Sandy loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Alluvium derived from granite  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 2.6 inches  
*Typical profile:*  
A1—0 to 0 inches; sandy loam  
A2—0 to 2 inches; sandy loam  
A3—2 to 5 inches; sandy loam  
Bw—5 to 10 inches; coarse sandy loam  
2C—10 to 72 inches; stratified gravelly coarse sand to very gravelly coarse sand

**Additional Components**

Valleyflat, lesser slopes, moderately impacted and similar soils: 8 percent  
Riverwash: 2 percent

**400C—Anaconda-Varney complex, 2 to 8 percent slopes,  
moderately impacted**

**Map Unit Setting**

*Interpretive focus:* Reclamation  
*Elevation:* 5,480 to 5,710 feet  
*Mean annual precipitation:* 12 to 14 inches  
*Frost-free period:* 70 to 90 days

### Component Description

#### **Anaconda, moderately impacted and similar soils**

*Composition:* 65 percent

*Geomorphic description:*

- Alluvial fan
- Base slope on hill

*Slope:* 4 to 8 percent

*Elevation:* 5,480 to 5,710 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Local alluvium derived from granite and/or colluvium derived from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 7.0 inches

*Typical profile:*

- A1—0 to 0 inches; sandy loam
- A2—0 to 8 inches; sandy loam
- Bw—8 to 17 inches; sandy loam
- Bk—17 to 36 inches; coarse sandy loam
- BC—36 to 60 inches; loamy sand

#### **Varney, moderately impacted and similar soils**

*Composition:* 20 percent

*Geomorphic description:*

- Alluvial fan
- Base slope on hill

*Slope:* 2 to 4 percent

*Elevation:* 5,480 to 5,710 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Sandy clay loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Local alluvium derived from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.9 inches

*Typical profile:*

- A1—0 to 0 inches; sandy clay loam
- A2—0 to 6 inches; sandy clay loam
- Bt—6 to 18 inches; sandy clay loam
- Bk—18 to 36 inches; sandy loam
- C—36 to 60 inches; gravelly loamy coarse sand

### Additional Components

Aridic Ustorthents, reclaimed area and similar soils: 10 percent

Dumps, mine: 5 percent

## **401D—Modess-Adit-Rockerjohn complex, 4 to 12 percent slopes, moderately impacted**

### **Map Unit Setting**

*Interpretive focus:* Reclamation

*Elevation:* 5,510 to 6,040 feet

*Mean annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Modess, moderately impacted and similar soils**

*Composition:* 45 percent

*Geomorphic description:* Side slope on hill

*Slope:* 4 to 12 percent, east to west aspects

*Elevation:* 5,510 to 6,040 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Gravelly coarse sandy loam

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 46 inches
- Lithic bedrock: 34 to 72 inches

*Drainage class:* Well drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 4.9 inches

*Typical profile:*

- A1—0 to 0 inches; gravelly coarse sandy loam
- A2—0 to 11 inches; gravelly coarse sandy loam
- Bw—11 to 18 inches; sandy clay loam
- Bk—18 to 30 inches; gravelly coarse sandy loam
- BC—30 to 38 inches; gravelly loamy coarse sand
- Cr—38 to 58 inches; bedrock
- R—58 to 60 inches; bedrock

#### **Adit, moderately impacted and similar soils**

*Composition:* 30 percent

*Geomorphic description:*

- Nose slope on hill
- Side slope on hill

*Slope:* 4 to 12 percent, east to west aspects

*Elevation:* 5,510 to 6,040 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Very gravelly loamy coarse sand

*Depth to restrictive feature:*

- Paralithic bedrock: 4 to 10 inches
- Lithic bedrock: 6 to 20 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 0.3 inches



*Typical profile:*

- A1—0 to 0 inches; very gravelly loamy coarse sand
- A2—0 to 2 inches; very gravelly loamy coarse sand
- BC—2 to 7 inches; very gravelly loamy coarse sand
- Cr—7 to 14 inches; bedrock
- R—14 to 60 inches; bedrock

**Rockerjohn, moderately impacted and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Side slope on hill

*Slope:* 4 to 8 percent, east to west aspects

*Elevation:* 5,510 to 6,040 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 6.0 inches

*Typical profile:*

- A1—0 to 0 inches; sandy loam
- A2—0 to 6 inches; sandy loam
- Bw—6 to 15 inches; coarse sandy loam
- BC—15 to 45 inches; gravelly coarse sand
- 2C—45 to 60 inches; sandy loam

**Additional Components**

Aridic Ustorthents, reclaimed area and similar soils: 3 percent

Rock outcrop: 2 percent

**402E—Typic Cryorthents, reclaimed area-Beeftrail,  
severely impacted complex, 4 to 30 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Reclamation

*Elevation:* 5,610 to 6,360 feet

*Mean annual precipitation:* 12 to 14 inches

*Frost-free period:* 50 to 70 days

**Component Description**

**Typic Cryorthents, reclaimed and similar soils**

*Composition:* 55 percent

*Definition:* Reclaimed mine soils and especially buried mine waste materials can be highly variable due to a number of factors. Soil profile data currently entered represents a “typical” reclaimed site on the Butte Hill based on local conditions and the reclamation strategy of capping contaminated material with crushed lime rock prior to spreading cover soil materials. Onsite investigations may be required to characterize reclaimed soils at specific sites.

*Geomorphic description:* Side slope on reconstructed hill

*Slope:* 4 to 25 percent, east to northwest aspects

*Elevation:* 5,610 to 6,360 feet  
*Effective annual precipitation:* 10 to 13 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Gravelly loamy coarse sand  
*Depth to restrictive feature:* None noted  
*Drainage class:* Somewhat excessively drained  
*Parent material:* Recontoured alluvium and/or colluvium derived from granite over contaminated mine spoil or earthy fill  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 1.9 inches  
*Typical profile:*  
    C1—0 to 15 inches; gravelly loamy coarse sand  
    C2—15 to 17 inches; extremely channery sandy loam  
    C3—17 to 60 inches; very cobbly loamy coarse sand

**Beeftrail, severely impacted and similar soils**

*Composition:* 20 percent  
*Geomorphic description:* Side slope on hill  
*Slope:* 15 to 30 percent, east to northwest aspects  
*Elevation:* 5,610 to 6,360 feet  
*Effective annual precipitation:* 10 to 13 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Coarse sandy loam  
*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 28 to 56 inches

*Drainage class:* Somewhat excessively drained  
*Parent material:* Residuum weathered from granite  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 2.2 inches  
*Typical profile:*  
    A1—0 to 0 inches; coarse sandy loam  
    A2—0 to 7 inches; coarse sandy loam  
    Bw—7 to 14 inches; gravelly coarse sandy loam  
    BC—14 to 26 inches; gravelly loamy coarse sand  
    Cr—26 to 35 inches; bedrock  
    R—35 to 45 inches; bedrock

**Additional Components**

Dumps, mine: 10 percent  
Minestope, severely impacted and similar soils: 10 percent  
Rock outcrop: 3 percent  
Zonite, severely impacted and similar soils: 2 percent

**404E—Beeftrail-Minestope-Dinnen complex, 4 to 25 percent slopes, moderately impacted**

**Map Unit Setting**

*Interpretive focus:* Reclamation  
*Elevation:* 5,510 to 6,280 feet

*Mean annual precipitation:* 12 to 14 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Beeftrail, moderately impacted and similar soils**

*Composition:* 50 percent

*Geomorphic description:* Side slope on hill

*Slope:* 8 to 25 percent

*Elevation:* 5,510 to 6,280 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Coarse sandy loam

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 28 to 56 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 2.2 inches

*Typical profile:*

- A1—0 to 0 inches; coarse sandy loam
- A2—0 to 7 inches; coarse sandy loam
- Bw—7 to 14 inches; gravelly coarse sandy loam
- BC—14 to 26 inches; gravelly loamy coarse sand
- Cr—26 to 35 inches; bedrock
- R—35 to 45 inches; bedrock

#### **Minestope, moderately impacted and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Nose slope on hill

*Slope:* 8 to 25 percent

*Elevation:* 5,510 to 6,280 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loamy coarse sand

*Depth to restrictive feature:*

- Paralithic bedrock: 10 to 20 inches
- Lithic bedrock: 20 to 40 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.3 inches

*Typical profile:*

- A1—0 to 0 inches; loamy coarse sand
- A2—0 to 6 inches; loamy coarse sand
- Bw—6 to 11 inches; gravelly coarse sandy loam
- BC—11 to 17 inches; very gravelly loamy coarse sand
- Cr—17 to 26 inches; bedrock
- R—26 to 36 inches; bedrock

#### **Dinnen, moderately impacted and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Side slope on swales or other depositional areas

*Slope:* 4 to 15 percent

*Elevation:* 5,510 to 6,280 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Coarse sandy loam

*Depth to restrictive feature:* Paralithic bedrock: Greater than 53 inches

*Drainage class:* Well drained

*Parent material:* Colluvium derived from granite over residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 6.4 inches

*Typical profile:*

A1—0 to 0 inches; coarse sandy loam

A2—0 to 9 inches; coarse sandy loam

Bw—9 to 21 inches; gravelly coarse sandy loam

BC—21 to 41 inches; gravelly coarse sandy loam

C—41 to 53 inches; gravelly loamy coarse sand

Cr—53 to 60 inches; bedrock

### **Additional Components**

Beeftrail, greater slopes, moderately impacted and similar soils: 5 percent

Typic Cryorthents, Reclaimed area and similar soils: 5 percent

Dumps, mine: 3 percent

Rock outcrop: 2 percent

## **405E—Minestope-Beeftrail, very bouldery-Nuley complex, 8 to 30 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,250 to 6,180 feet

*Mean annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Minestope and similar soils**

*Composition:* 35 percent

*Geomorphic description:*

- Shoulder on hill
- Summit on hill

*Slope:* 8 to 30 percent

*Elevation:* 5,250 to 6,180 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:*

- Paralithic bedrock: 10 to 20 inches
- Lithic bedrock: 20 to 40 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.3 inches

*Typical profile:*

- A—0 to 6 inches; sandy loam
- Bw—6 to 11 inches; gravelly coarse sandy loam
- BC—11 to 17 inches; very gravelly loamy coarse sand
- Cr—17 to 26 inches; bedrock
- R—26 to 36 inches; bedrock

**Beeftrail, very bouldery and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Backslope on hill

*Slope:* 15 to 30 percent

*Elevation:* 5,250 to 6,180 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly coarse sandy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent boulders, 20 to 67 feet apart

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 28 to 56 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 2.1 inches

*Typical profile:*

- A—0 to 7 inches; gravelly coarse sandy loam
- Bw—7 to 14 inches; gravelly coarse sandy loam
- BC—14 to 26 inches; gravelly loamy coarse sand
- Cr—26 to 35 inches; bedrock
- R—35 to 45 inches; bedrock

**Nuley and similar soils**

*Composition:* 15 percent

*Geomorphic description:*

- Footslope on hill
- Swale

*Slope:* 8 to 15 percent

*Elevation:* 5,250 to 6,180 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:*

- Paralithic bedrock: 40 to 60 inches
- Lithic bedrock: 52 to 72 inches

*Drainage class:* Well drained

*Parent material:* Colluvium derived from granite over residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.2 inches

*Typical profile:*

- A—0 to 6 inches; sandy loam
- Bt—6 to 18 inches; loam
- Bk—18 to 30 inches; sandy loam
- 2C—30 to 44 inches; gravelly loamy coarse sand

Cr—44 to 56 inches; bedrock

R—56 to 60 inches; bedrock

### **Additional Components**

Beeftrail, very bouldery and similar soils: 10 percent

Rock outcrop: 10 percent

## **406E—Stecum, very bouldery-Comad-Rock outcrop complex, 8 to 30 slopes**

### **Map Unit Setting**

*Interpretive focus:* Forestland

*Elevation:* 6,310 to 7,770 feet

*Mean annual precipitation:* 15 to 19 inches

*Frost-free period:* 30 to 50 days

### **Component Description**

#### **Stecum, very bouldery and similar soils**

*Composition:* 50 percent

*Geomorphic description:* Mountainflank on south-tending mountainside

*Slope:* 15 to 30 percent, east to northwest aspects

*Elevation:* 6,320 to 7,780 feet

*Effective annual precipitation:* 13 to 17 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Gravelly loamy coarse sand

*Rock fragments on the soil surface:* 0.10 to 5.00 percent boulders, 13 to 40 feet apart

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 24 to 48 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 1.2 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

A—1 to 7 inches; gravelly loamy coarse sand

BC—7 to 25 inches; very stony coarse sand

Cr—25 to 38 inches; bedrock

R—38 to 48 inches; bedrock

#### **Comad and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Mountainbase on south-tending mountainside

*Slope:* 8 to 25 percent, east to northwest aspects

*Elevation:* 6,320 to 7,780 feet

*Effective annual precipitation:* 13 to 17 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Gravelly loamy coarse sand

*Depth to restrictive feature:* None noted

*Drainage class:* Excessively drained

*Parent material:* Colluvium derived from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 2.3 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

E—2 to 8 inches; gravelly loamy coarse sand

E and Bt—8 to 26 inches; very gravelly loamy coarse sand

C—26 to 60 inches; very gravelly coarse sand

**Rock outcrop**

*Composition:* 15 percent

*Definition:* Moderately to strongly indurated quartz monzonite of the Boulder Batholith

**Additional Components**

Goldflint and similar soils: 10 percent

Stecum, very stony loamy coarse sand and similar soils: 5 percent

**407D—Adit-Adit, moist-Rock outcrop complex, 8 to 25 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland and forestland

*Elevation:* 5,310 to 6,230 feet

*Mean annual precipitation:* 13 to 15 inches

*Frost-free period:* 55 to 90 days

**Component Description**

**Adit and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Side slope on south-tending hillside

*Slope:* 15 to 25 percent, east to northwest aspects

*Elevation:* 5,310 to 6,230 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Gravelly loamy coarse sand

*Depth to restrictive feature:*

- Paralithic bedrock: 4 to 10 inches
- Lithic bedrock: 6 to 20 inches

*Drainage class:* Excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 0.3 inches

*Typical profile:*

A—0 to 2 inches; gravelly loamy coarse sand

BC—2 to 7 inches; very gravelly loamy coarse sand

Cr—7 to 14 inches; bedrock

R—14 to 60 inches; bedrock

**Adit, moist and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Ridge

*Slope:* 8 to 25 percent

*Elevation:* 5,310 to 6,230 feet

*Effective annual precipitation:* 13 to 15 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Very gravelly loamy coarse sand

*Depth to restrictive feature:*

- Paralithic bedrock: 4 to 10 inches
- Lithic bedrock: 6 to 20 inches

*Drainage class:* Excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 0.3 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

A—1 to 2 inches; very gravelly loamy coarse sand

BC—2 to 7 inches; very gravelly loamy coarse sand

Cr—7 to 14 inches; bedrock

R—14 to 60 inches; bedrock

### **Rock outcrop**

*Composition:* 15 percent

*Definition:* Moderately to strongly indurated quartz monzonite of the Boulder Batholith

### **Modess and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Ridge

*Slope:* 8 to 20 percent, east to northwest aspects

*Elevation:* 5,310 to 6,230 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Coarse sandy loam

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 46 inches
- Lithic bedrock: 34 to 72 inches

*Drainage class:* Well drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 4.9 inches

*Typical profile:*

A—0 to 11 inches; coarse sandy loam

Bw—11 to 18 inches; sandy clay loam

Bk—18 to 30 inches; gravelly coarse sandy loam

BC—30 to 38 inches; gravelly loamy coarse sand

Cr—38 to 58 inches; bedrock

R—58 to 60 inches; bedrock

### **Additional Components**

Stecum and similar soils: 10 percent

Modess, lesser slopes and similar soils: 5 percent



## **408E—Stecum-Mooseflat-Basincreek complex, 4 to 30 percent slopes, very bouldery**

### **Map Unit Setting**

*Interpretive focus:* Forestland and riparian

*Elevation:* 5,310 to 6,230 feet

*Mean annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Stecum, very bouldery and similar soils**

*Composition:* 40 percent

*Geomorphic description:* Backslope on mountain

*Slope:* 12 to 30 percent

*Elevation:* 5,310 to 6,230 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly coarse sandy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent boulders, 20 to 83 feet apart

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 24 to 48 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 1.2 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

A—1 to 7 inches; gravelly coarse sandy loam

BC—7 to 25 inches; very stony coarse sand

Cr—25 to 38 inches; bedrock

R—38 to 48 inches; bedrock

#### **Mooseflat, very bouldery and similar soils**

*Composition:* 35 percent

*Geomorphic description:*

- Drainageway
- Toeslope on mountain

*Slope:* 4 to 12 percent

*Elevation:* 5,310 to 6,230 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Mucky peat

*Rock fragments on the soil surface:* 0.10 to 3.00 percent boulders, 20 to 83 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Very poorly drained

*Parent material:* Mixed alluvium over alluvium derived from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Water table:* Present

*Available water capacity:* Mainly 5.1 inches

*Typical profile:*

- Oe—0 to 5 inches; mucky peat
- A—5 to 14 inches; silt loam
- Bg—14 to 28 inches; sandy clay loam
- 2Cg—28 to 72 inches; very gravelly coarse sand

**Basincreek, very bouldery and similar soils**

*Composition:* 20 percent

*Geomorphic description:*

- Footslope on mountain
- Terrace

*Slope:* 4 to 15 percent

*Elevation:* 5,310 to 6,230 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Sandy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent boulders, 20 to 83 feet apart

*Depth to restrictive feature:* Lithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Colluvium derived from granite over residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 3.7 inches

*Typical profile:*

- Oi—0 to 2 inches; slightly decomposed plant material
- E—2 to 18 inches; sandy loam
- E and Bw—18 to 38 inches; gravelly coarse sandy loam
- BC—38 to 46 inches; very gravelly sand
- R—46 to 60 inches; bedrock

**Additional Components**

Rock outcrop: 5 percent

**409E—Stecum, moderately impacted, very stony-Rock outcrop-Zonite, moderately impacted, very bouldery complex, 8 to 30 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Forestland

*Elevation:* 5,710 to 7,040 feet

*Mean annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

**Component Description**

**Stecum, moderately impacted, very stony and similar soils**

*Composition:* 40 percent

*Geomorphic description:* Side slope on south-facing hillside

*Slope:* 15 to 30 percent, east to northwest aspects

*Elevation:* 5,710 to 7,040 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very gravelly loamy coarse sand

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 33 feet apart

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 24 to 48 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 1.2 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

A1—1 to 2 inches; very gravelly loamy coarse sand

A2—2 to 7 inches; very gravelly loamy coarse sand

BC—7 to 25 inches; very stony coarse sand

Cr—25 to 38 inches; bedrock

R—38 to 48 inches; bedrock

### **Rock outcrop**

*Composition:* 25 percent

*Definition:* Moderately to strongly indurated quartz monzonite of the Boulder Batholith

### **Zonite, moderately impacted, very bouldery and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Nose slope on south-facing hillside

*Slope:* 8 to 30 percent, east to northwest aspects

*Elevation:* 5,710 to 7,040 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very gravelly loamy coarse sand

*Rock fragments on the soil surface:* 0.10 to 3.00 percent boulders, 20 to 83 feet apart

*Depth to restrictive feature:* Lithic bedrock: 6 to 14 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 0.4 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

A1—1 to 2 inches; very gravelly loamy coarse sand

A2—2 to 4 inches; very gravelly loamy coarse sand

BC—4 to 9 inches; very gravelly loamy coarse sand

R—9 to 19 inches; bedrock

### **Additional Components**

Beeftrail, moderately impacted, very bouldery and similar soils: 10 percent

Wissikihon, moderately impacted and similar soils: 10 percent

## **410E—Bobowic-Peeler-Caseypeak complex, 15 to 45 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Forestland

*Elevation:* 5,710 to 7,040 feet

*Mean annual precipitation:* 14 to 17 inches

*Frost-free period:* 30 to 50 days

### **Component Description**

#### **Bobowic and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Side slope on north-facing hillside

*Slope:* 15 to 45 percent, west to east aspects

*Elevation:* 5,710 to 7,040 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Coarse sandy loam

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 22 to 48 inches

*Drainage class:* Well drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 2.1 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

E—1 to 11 inches; coarse sandy loam

Bw—11 to 21 inches; gravelly coarse sandy loam

BC—21 to 29 inches; very gravelly loamy coarse sand

Cr—29 to 34 inches; bedrock

R—34 to 60 inches; bedrock

#### **Peeler and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Head slope on north-facing hillside

*Slope:* 15 to 35 percent, west to east aspects

*Elevation:* 5,710 to 7,040 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 4.3 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

Oe—1 to 2 inches; moderately decomposed plant material

E—2 to 14 inches; sandy loam

E/Bt—14 to 24 inches; gravelly coarse sandy loam

Bt—24 to 38 inches; gravelly sandy clay loam

BC—38 to 60 inches; very gravelly loamy coarse sand

#### **Caseypeak and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Nose slope on north-facing hillside

*Slope:* 15 to 45 percent, west to east aspects

*Elevation:* 5,710 to 7,040 feet  
*Effective annual precipitation:* 15 to 19 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Coarse sandy loam  
*Depth to restrictive feature:*

- Paralithic bedrock: 10 to 20 inches
- Lithic bedrock: 12 to 24 inches

*Drainage class:* Well drained  
*Parent material:* Residuum weathered from granite  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 0.9 inches  
*Typical profile:*

- Oi—0 to 1 inches; slightly decomposed plant material
- A—1 to 7 inches; coarse sandy loam
- Bw—7 to 14 inches; very gravelly coarse sandy loam
- Cr—14 to 19 inches; bedrock
- R—19 to 60 inches; bedrock

#### **Additional Components**

Branham and similar soils: 10 percent  
Rock outcrop: 5 percent  
Stecum and similar soils: 5 percent

### **411D—Modess-Nuley complex, 4 to 12 percent slopes**

#### **Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,170 to 5,890 feet  
*Mean annual precipitation:* 12 to 14 inches  
*Frost-free period:* 55 to 90 days

#### **Component Description**

##### **Modess and similar soils**

*Composition:* 60 percent  
*Geomorphic description:* Bedrock-floored pediment  
*Slope:* 4 to 8 percent  
*Elevation:* 5,170 to 5,890 feet  
*Effective annual precipitation:* 12 to 14 inches  
*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Sandy loam  
*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 46 inches
- Lithic bedrock: 34 to 72 inches

*Drainage class:* Well drained  
*Parent material:* Residuum weathered from granite  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 4.9 inches  
*Typical profile:*

- A—0 to 11 inches; sandy loam
- Bw—11 to 18 inches; sandy clay loam
- Bk—18 to 30 inches; gravelly coarse sandy loam

BC—30 to 38 inches; gravelly loamy coarse sand

Cr—38 to 58 inches; bedrock

R—58 to 60 inches; bedrock

**Nuley and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Bedrock-floored pediment

*Slope:* 4 to 12 percent

*Elevation:* 5,170 to 5,890 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Loam

*Depth to restrictive feature:*

- Paralithic bedrock: 40 to 60 inches
- Lithic bedrock: Greater than 56 inches

*Drainage class:* Well drained

*Parent material:* Colluvium derived from granite over residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.2 inches

*Typical profile:*

A—0 to 6 inches; loam

Bt—6 to 18 inches; loam

Bk—18 to 30 inches; sandy loam

2C—30 to 44 inches; gravelly loamy coarse sand

Cr—44 to 56 inches; bedrock

R—56 to 60 inches; bedrock

**Additional Components**

Adit and similar soils: 6 percent

Branham and similar soils: 5 percent

Varney, sandy substratum and similar soils: 5 percent

Rock outcrop: 2 percent

Tuggle, moist and similar soils: 2 percent

**412E—Stecum, stony-Zonite, stony-Rock outcrop complex, 15 to 35 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Forestland

*Elevation:* 5,310 to 6,500 feet

*Mean annual precipitation:* 14 to 17 inches

*Frost-free period:* 50 to 70 days

**Component Description**

**Stecum, stony and similar soils**

*Composition:* 50 percent

*Geomorphic description:* Side slope on south-facing hillside

*Slope:* 15 to 35 percent, east to west aspects

*Elevation:* 5,350 to 6,500 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly loamy coarse sand

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 150 feet apart

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 24 to 48 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 1.2 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

A—1 to 7 inches; gravelly loamy coarse sand

BC—7 to 25 inches; very stony coarse sand

Cr—25 to 38 inches; bedrock

R—38 to 48 inches; bedrock

### **Zonite, stony and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Side slope on south-facing hillside

*Slope:* 15 to 35 percent, east to west aspects

*Elevation:* 5,500 to 6,000 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly loamy coarse sand

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 150 feet apart

*Depth to restrictive feature:* Lithic bedrock: 6 to 14 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 0.4 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

A—1 to 4 inches; gravelly loamy coarse sand

BC—4 to 9 inches; very gravelly loamy coarse sand

R—9 to 19 inches; bedrock

### **Rock outcrop**

*Composition:* 15 percent

*Definition:* Moderately to strongly indurated quartz monzonite of the Boulder Batholith

### **Additional Components**

Wissikihon and similar soils: 7 percent

Beeftrail and similar soils: 5 percent

Mooseflat, very bouldery and similar soils: 3 percent

## **413E—Modess-Adit-Rock outcrop complex, 4 to 35 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,120 to 5,820 feet

*Mean annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Modess and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Side slope on south-facing hillside

*Slope:* 15 to 35 percent, east to west aspects

*Elevation:* 5,120 to 5,820 feet

*Effective annual precipitation:* 10 to 13 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Gravelly coarse sandy loam

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 46 inches
- Lithic bedrock: 34 to 72 inches

*Drainage class:* Well drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 4.9 inches

*Typical profile:*

- A—0 to 11 inches; gravelly coarse sandy loam
- Bw—11 to 18 inches; sandy clay loam
- Bk—18 to 30 inches; gravelly coarse sandy loam
- BC—30 to 38 inches; gravelly loamy coarse sand
- Cr—38 to 58 inches; bedrock
- R—58 to 60 inches; bedrock

#### **Adit and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Nose slope on south-facing hillside

*Slope:* 4 to 25 percent, east to west aspects

*Elevation:* 5,120 to 5,820 feet

*Effective annual precipitation:* 10 to 13 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Gravelly coarse sandy loam

*Depth to restrictive feature:*

- Paralithic bedrock: 4 to 10 inches
- Lithic bedrock: 6 to 20 inches

*Drainage class:* Excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 0.3 inches

*Typical profile:*

- A—0 to 2 inches; gravelly coarse sandy loam
- BC—2 to 7 inches; very gravelly loamy coarse sand
- Cr—7 to 14 inches; bedrock
- R—14 to 60 inches; bedrock

#### **Rock outcrop**

*Composition:* 15 percent

*Definition:* Moderately to strongly indurated quartz monzonite of the Boulder Batholith



### **Additional Components**

Anaconda and similar soils: 10 percent

Nestley and similar soils: 10 percent

## **414G—Rock outcrop-Stecum-Comad complex, 30 to 90 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Watershed

*Elevation:* 5,760 to 7,740 feet

*Mean annual precipitation:* 12 to 15 inches

*Frost-free period:* 30 to 70 days

### **Component Description**

#### **Rock outcrop**

*Composition:* 40 percent

*Definition:* Strongly indurated quartz monzonite of the Boulder Batholith, often containing dikes of very strongly indurated, finer-grained aplites

#### **Stecum and similar soils**

*Composition:* 25 percent

*Geomorphic description:*

- Mountainflank on mountain
- Peak

*Slope:* 45 to 90 percent, east to northwest aspects

*Elevation:* 5,760 to 7,740 feet

*Effective annual precipitation:* 10 to 13 inches

*Frost-free period:* 30 to 70 days

*Surface layer texture:* Very stony loamy coarse sand

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 24 to 48 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 1.2 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

A—1 to 7 inches; very stony loamy coarse sand

BC—7 to 25 inches; very stony coarse sand

Cr—25 to 38 inches; bedrock

R—38 to 48 inches; bedrock

#### **Comad and similar soils**

*Composition:* 15 percent

*Geomorphic description:*

- Mountainflank on mountain
- Peak

*Slope:* 30 to 75 percent, east to northwest aspects

*Elevation:* 5,760 to 7,740 feet

*Effective annual precipitation:* 10 to 13 inches

*Frost-free period:* 30 to 70 days  
*Surface layer texture:* Very stony loamy coarse sand  
*Depth to restrictive feature:* None noted  
*Drainage class:* Excessively drained  
*Parent material:* Colluvium derived from granite  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 2.1 inches  
*Typical profile:*  
    Oi—0 to 2 inches; slightly decomposed plant material  
    E—2 to 8 inches; very stony loamy coarse sand  
    E and Bt—8 to 26 inches; very stony loamy coarse sand  
    C—26 to 60 inches; extremely stony sand

#### **Additional Components**

Stecum, moist and similar soils: 10 percent  
Zonite and similar soils: 8 percent  
Riverwash, dry: 2 percent

### **415F—Stecum-Goldflint-Basincreek complex, 20 to 50 percent slopes, extremely stony**

#### **Map Unit Setting**

*Interpretive focus:* Forestland  
*Elevation:* 6,040 to 7,970 feet  
*Mean annual precipitation:* 14 to 17 inches  
*Frost-free period:* 30 to 50 days

#### **Component Description**

##### **Stecum, extremely stony and similar soils**

*Composition:* 45 percent  
*Geomorphic description:* Mountainflank on north-tending mountainside  
*Slope:* 20 to 50 percent, west to southeast aspects  
*Elevation:* 6,040 to 7,970 feet  
*Effective annual precipitation:* 16 to 19 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Gravelly loamy coarse sand  
*Rock fragments on the soil surface:* 3 to 15 percent stones, 3 to 10 feet apart  
*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 24 to 48 inches

*Drainage class:* Somewhat excessively drained  
*Parent material:* Residuum weathered from granite  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 1.2 inches  
*Typical profile:*  
    Oi—0 to 1 inches; slightly decomposed plant material  
    A—1 to 7 inches; gravelly loamy coarse sand  
    BC—7 to 25 inches; very stony coarse sand  
    Cr—25 to 38 inches; bedrock  
    R—38 to 48 inches; bedrock

**Goldflint, extremely stony and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Mountainflank on north-tending mountainside

*Slope:* 20 to 50 percent, west to southeast aspects

*Elevation:* 6,040 to 7,970 feet

*Effective annual precipitation:* 16 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Very gravelly loamy coarse sand

*Rock fragments on the soil surface:* 3 to 15 percent stones, 3 to 10 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 0.8 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

A—1 to 4 inches; very gravelly loamy coarse sand

Bw—4 to 9 inches; gravelly loamy coarse sand

BC—9 to 18 inches; very gravelly coarse sand

R—18 to 28 inches; bedrock

**Basincreek, extremely stony and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Mountainflank on north-tending mountainside

*Slope:* 20 to 50 percent, west to southeast aspects

*Elevation:* 6,040 to 7,970 feet

*Effective annual precipitation:* 16 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Very gravelly loamy coarse sand

*Rock fragments on the soil surface:* 3 to 15 percent stones, 3 to 10 feet apart

*Depth to restrictive feature:* Lithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Colluvium derived from granite over residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 3.7 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

E—2 to 18 inches; very gravelly loamy coarse sand

E and Bw—18 to 38 inches; gravelly coarse sandy loam

BC—38 to 46 inches; very gravelly sand

R—46 to 60 inches; bedrock

**Additional Components**

Basincreek, very stony, lesser slopes and similar soils: 10 percent

Rock outcrop: 10 percent

## **416E—Beeftrail-Fleecer-Stecum complex, 8 to 45 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland and forestland

*Elevation:* 5,630 to 6,580 feet

*Mean annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Beeftrail and similar soils**

*Composition:* 25 percent

*Geomorphic description:* Side slope on north-tending hill

*Slope:* 15 to 45 percent, west to southeast aspects

*Elevation:* 5,630 to 6,580 feet

*Effective annual precipitation:* 16 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Coarse sandy loam

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 28 to 56 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 2.2 inches

*Typical profile:*

A—0 to 7 inches; coarse sandy loam

Bw—7 to 14 inches; gravelly coarse sandy loam

BC—14 to 26 inches; gravelly loamy coarse sand

Cr—26 to 35 inches; bedrock

R—35 to 45 inches; bedrock

#### **Fleecer and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Head slope on north-tending hill

*Slope:* 8 to 25 percent, west to southeast aspects

*Elevation:* 5,630 to 6,580 feet

*Effective annual precipitation:* 16 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Local alluvium derived from granite and/or colluvium derived from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 6.9 inches

*Typical profile:*

A—0 to 18 inches; sandy loam

Bw—18 to 34 inches; gravelly coarse sandy loam

BC—34 to 50 inches; gravelly loamy coarse sand

C—50 to 60 inches; gravelly loamy coarse sand

**Stecum and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Side slope on north-tending hill

*Slope:* 15 to 45 percent, west to southeast aspects

*Elevation:* 5,630 to 6,580 feet

*Effective annual precipitation:* 16 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly loamy coarse sand

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 24 to 48 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 1.2 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

A—1 to 7 inches; gravelly loamy coarse sand

BC—7 to 25 inches; very stony coarse sand

Cr—25 to 38 inches; bedrock

R—38 to 48 inches; bedrock

**Highrye and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Side slope on north-tending hill

*Slope:* 15 to 35 percent, west to southeast aspects

*Elevation:* 5,630 to 6,580 feet

*Effective annual precipitation:* 16 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Coarse sandy loam

*Depth to restrictive feature:* Paralithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Colluvium derived from granite over residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.3 inches

*Typical profile:*

A—0 to 11 inches; coarse sandy loam

Bt—11 to 32 inches; gravelly sandy clay loam

BC—32 to 46 inches; gravelly coarse sandy loam

C—46 to 56 inches; very gravelly coarse sand

Cr—56 to 60 inches; bedrock

**Additional Components**

Rock outcrop: 10 percent

Goldflint and similar soils: 5 percent

Wissikihon and similar soils: 5 percent

## 417E—Fleecer-Tuggle complex, 8 to 30 percent slopes

### Map Unit Setting

*Interpretive focus:* Rangeland  
*Elevation:* 5,720 to 6,640 feet  
*Mean annual precipitation:* 14 to 17 inches  
*Frost-free period:* 50 to 70 days

### Component Description

#### **Fleecer and similar soils**

*Composition:* 60 percent  
*Geomorphic description:* Side slope on hill  
*Slope:* 8 to 30 percent, west to east aspects  
*Elevation:* 5,720 to 6,640 feet  
*Effective annual precipitation:* 17 to 19 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Sandy loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Local alluvium derived from granite and/or colluvium derived from granite  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 4.9 inches  
*Typical profile:*  
    A—0 to 24 inches; sandy loam  
    Bw—24 to 34 inches; gravelly coarse sandy loam  
    BC—34 to 50 inches; gravelly loamy coarse sand  
    C—50 to 60 inches; gravelly loamy coarse sand

#### **Tuggle and similar soils**

*Composition:* 15 percent  
*Geomorphic description:* Nose slope on hill  
*Slope:* 8 to 30 percent, west to east aspects  
*Elevation:* 5,720 to 6,640 feet  
*Effective annual precipitation:* 17 to 19 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Gravelly coarse sandy loam  
*Depth to restrictive feature:*

- Paralithic bedrock: 10 to 20 inches
- Lithic bedrock: Greater than 18 inches

*Drainage class:* Well drained  
*Parent material:* Residuum weathered from granite  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 1.6 inches  
*Typical profile:*  
    A—0 to 6 inches; gravelly coarse sandy loam  
    Bw—6 to 12 inches; gravelly coarse sandy loam  
    BC—12 to 14 inches; very gravelly loamy coarse sand  
    Cr—14 to 18 inches; bedrock  
    R—18 to 28 inches; bedrock

### **Additional Components**

Branham and similar soils: 10 percent  
Bavdark and similar soils: 5 percent  
Beeftrail and similar soils: 5 percent  
Rock outcrop: 3 percent  
Zonite and similar soils: 2 percent

## **419E—Peeler-Comad complex, 8 to 30 percent slopes, very stony**

### **Map Unit Setting**

*Interpretive focus:* Forestland  
*Elevation:* 6,120 to 7,430 feet  
*Mean annual precipitation:* 19 to 22 inches  
*Frost-free period:* 30 to 50 days

### **Component Description**

#### **Peeler, very stony and similar soils**

*Composition:* 45 percent  
*Geomorphic description:* Mountainflank on north-tending mountainside  
*Slope:* 12 to 30 percent, west to southeast aspects  
*Elevation:* 6,120 to 7,430 feet  
*Effective annual precipitation:* 20 to 24 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Gravelly loamy coarse sand  
*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 10 to 40 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Colluvium derived from granite  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 4.3 inches  
*Typical profile:*  
    Oi—0 to 1 inches; slightly decomposed plant material  
    Oe—1 to 2 inches; slightly decomposed plant material  
    E—2 to 14 inches; gravelly loamy coarse sand  
    E/Bt—14 to 24 inches; gravelly coarse sandy loam  
    Bt—24 to 38 inches; gravelly sandy clay loam  
    BC—38 to 60 inches; very gravelly loamy coarse sand

#### **Comad, very stony and similar soils**

*Composition:* 40 percent  
*Geomorphic description:* Mountainflank on north-tending mountainside  
*Slope:* 8 to 30 percent, west to southeast aspects  
*Elevation:* 6,120 to 7,430 feet  
*Effective annual precipitation:* 20 to 24 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Gravelly loamy coarse sand  
*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 10 to 40 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Excessively drained  
*Parent material:* Colluvium derived from granite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 2.3 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

E—2 to 8 inches; gravelly loamy coarse sand

E and Bt—8 to 26 inches; very gravelly loamy coarse sand

C—26 to 60 inches; very gravelly coarse sand

#### **Additional Components**

Goldflint and similar soils: 10 percent

Rock outcrop: 5 percent

### **420B—Dinnen-Wissikihon-Shewag complex, 1 to 6 percent slopes**

#### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 6,280 to 6,690 feet

*Mean annual precipitation:* 19 to 24 inches

*Frost-free period:* 30 to 50 days

#### **Component Description**

##### **Dinnen and similar soils**

*Composition:* 45 percent

*Geomorphic description:* Alluvial fan

*Slope:* 1 to 6 percent

*Elevation:* 6,280 to 6,690 feet

*Effective annual precipitation:* 19 to 24 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Coarse sandy loam

*Depth to restrictive feature:* Paralithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Alluvium derived from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 6.4 inches

*Typical profile:*

A—0 to 9 inches; coarse sandy loam

Bw—9 to 21 inches; gravelly coarse sandy loam

BC—21 to 41 inches; gravelly coarse sandy loam

C—41 to 53 inches; gravelly loamy coarse sand

Cr—53 to 60 inches; bedrock

##### **Wissikihon and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Alluvial fan

*Slope:* 1 to 4 percent

*Elevation:* 6,280 to 6,690 feet

*Effective annual precipitation:* 19 to 24 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Coarse sandy loam



*Depth to restrictive feature:* Paralithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Alluvium derived from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.0 inches

*Typical profile:*

A—0 to 8 inches; coarse sandy loam

Bw—8 to 16 inches; gravelly coarse sandy loam

BC—16 to 48 inches; gravelly loamy coarse sand

Cr—48 to 60 inches; bedrock

### **Shewag and similar soils**

*Composition:* 20 percent

*Geomorphic description:*

- Alluvial fan
- Swale

*Slope:* 1 to 4 percent

*Elevation:* 6,280 to 6,690 feet

*Effective annual precipitation:* 19 to 24 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Mucky peat

*Depth to restrictive feature:* None noted

*Drainage class:* Moderately well drained

*Parent material:* Mixed alluvium over alluvium derived from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Water table:* Present

*Available water capacity:* Mainly 3.9 inches

*Typical profile:*

Oe—0 to 2 inches; mucky peat

A—2 to 8 inches; sandy loam

Bw—8 to 14 inches; coarse sandy loam

2C—14 to 72 inches; gravelly loamy coarse sand

## **421B—Shewag-Shewag, moderately well drained complex, 1 to 4 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 6,270 to 6,380 feet

*Mean annual precipitation:* 19 to 24 inches

*Frost-free period:* 30 to 50 days

### **Component Description**

#### **Shewag and similar soils**

*Composition:* 75 percent

*Geomorphic description:* Lower part of alluvial fan

*Slope:* 1 to 4 percent

*Elevation:* 6,270 to 6,380 feet

*Effective annual precipitation:* 19 to 24 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Sandy loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Somewhat poorly drained  
*Parent material:* Mixed alluvium over alluvium derived from granite  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Water table:* Present  
*Available water capacity:* Mainly 3.6 inches  
*Typical profile:*  
    A—0 to 8 inches; sandy loam  
    Bw—8 to 14 inches; sandy loam  
    2C—14 to 72 inches; very gravelly coarse sand

**Shewag, moderately well drained and similar soils**

*Composition:* 20 percent  
*Geomorphic description:* Upper part of alluvial fan  
*Slope:* 1 to 4 percent  
*Elevation:* 6,270 to 6,380 feet  
*Effective annual precipitation:* 19 to 24 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Mucky peat  
*Depth to restrictive feature:* None noted  
*Drainage class:* Moderately well drained  
*Parent material:* Mixed alluvium over alluvium derived from granite  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Water table:* Present  
*Available water capacity:* Mainly 3.9 inches  
*Typical profile:*  
    Oe—0 to 2 inches; mucky peat  
    A—2 to 8 inches; sandy loam  
    Bw—8 to 14 inches; coarse sandy loam  
    2C—14 to 72 inches; gravelly loamy coarse sand

**Additional Components**

Fleecer and similar soils: 5 percent

**423D—Fleecer-Dinnen complex, 4 to 15 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 6,230 to 7,220 feet  
*Mean annual precipitation:* 19 to 24 inches  
*Frost-free period:* 30 to 50 days

**Component Description**

**Fleecer and similar soils**

*Composition:* 50 percent  
*Geomorphic description:* Side slope on hill  
*Slope:* 4 to 12 percent  
*Elevation:* 6,230 to 7,220 feet  
*Effective annual precipitation:* 19 to 24 inches  
*Frost-free period:* 30 to 50 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Local alluvium derived from granite and/or colluvium derived from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 4.9 inches

*Typical profile:*

A—0 to 24 inches; sandy loam

Bw—24 to 34 inches; gravelly coarse sandy loam

BC—34 to 50 inches; gravelly loamy coarse sand

C—50 to 60 inches; gravelly loamy coarse sand

#### **Dinnen and similar soils**

*Composition:* 35 percent

*Geomorphic description:*

- Interfluvial on hill
- Nose slope on hill

*Slope:* 6 to 15 percent

*Elevation:* 6,230 to 7,220 feet

*Effective annual precipitation:* 19 to 24 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Gravelly coarse sandy loam

*Depth to restrictive feature:* Paralithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Colluvium derived from granite over residuum weathered from granite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 6.4 inches

*Typical profile:*

A—0 to 9 inches; gravelly coarse sandy loam

Bw—9 to 21 inches; gravelly coarse sandy loam

BC—21 to 41 inches; gravelly coarse sandy loam

C—41 to 53 inches; gravelly loamy coarse sand

Cr—53 to 60 inches; bedrock

#### **Additional Components**

Bavdark and similar soils: 10 percent

Rock outcrop: 5 percent

### **501C—Patouza-Chinasprings-Dutton complex, 2 to 8 percent slopes, moderately impacted**

#### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,120 to 5,790 feet

*Mean annual precipitation:* 14 to 16 inches

*Frost-free period:* 70 to 90 days

### Component Description

#### **Patouza, moderately impacted and similar soils**

*Composition:* 50 percent

*Geomorphic description:* Upper part of alluvial fan

*Slope:* 2 to 6 percent

*Elevation:* 5,120 to 5,790 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* Paralithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Clayey alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 9.3 inches

*Typical profile:*

A1—0 to 0 inches; loam

A2—0 to 7 inches; loam

Bt—7 to 19 inches; clay loam

Bk—19 to 41 inches; loam

BCk—41 to 57 inches; sandy clay loam

Cr—57 to 60 inches; bedrock

#### **Chinasprings, moderately impacted and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Drainage footslopes on alluvial fan

*Slope:* 2 to 8 percent

*Elevation:* 5,120 to 5,790 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Ashy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Volcanic ash-influenced alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 6.0 inches

*Typical profile:*

A1—0 to 0 inches; ashy loam

A2—0 to 6 inches; ashy loam

Bt—6 to 16 inches; gravelly ashy sandy clay loam

Bk1—16 to 24 inches; ashy gravelly sandy loam

Bk2—24 to 40 inches; ashy gravelly sandy loam

BCk—40 to 80 inches; gravelly ashy sandy loam

#### **Dutton, moderately impacted and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Side slope of drainageway

*Slope:* 2 to 8 percent

*Elevation:* 5,120 to 5,790 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* Paralithic bedrock: 20 to 40 inches

*Drainage class:* Well drained

*Parent material:* Clayey alluvium and/or residuum over interbedded sandstone and shale

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.8 inches

*Typical profile:*

A1—0 to 0 inches; loam

A2—0 to 8 inches; loam

Bt—8 to 18 inches; clay loam

Bk—18 to 34 inches; clay loam

Cr—34 to 60 inches; bedrock

### **Additional Components**

Travona, moderately impacted, very stony and similar soils: 5 percent

## **502E—Hungryhill-Savenac complex, 8 to 30 percent slopes, stony**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,220 to 7,050 feet

*Mean annual precipitation:* 12 to 15 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Hungryhill, stony and similar soils**

*Composition:* 70 percent

*Geomorphic description:* Backslope on hill

*Slope:* 8 to 25 percent, west to southeast aspects

*Elevation:* 5,220 to 7,050 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* Lithic bedrock: 20 to 40 inches

*Drainage class:* Well drained

*Parent material:* Loamy skeletal colluvium over volcanic and sedimentary rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.2 inches

*Typical profile:*

A1—0 to 4 inches; gravelly loam

A2—4 to 11 inches; gravelly loam

Bt—11 to 20 inches; very gravelly sandy clay loam

BC—20 to 31 inches; very gravelly sandy loam

R—31 to 60 inches; bedrock

#### **Savenac, stony, dry and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Backslope on hill

*Slope:* 15 to 30 percent, west to southeast aspects

*Elevation:* 5,220 to 7,050 feet  
*Effective annual precipitation:* 15 to 17 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Ashy loam  
*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Volcanic ash and/or loess over clayey colluvium derived from volcanic rock  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Water table:* Present  
*Available water capacity:* Mainly 8.1 inches  
*Typical profile:*  
    Oi—0 to 1 inches; slightly decomposed plant material  
    E—1 to 12 inches; ashy loam  
    E/Bt—12 to 28 inches; sandy clay loam  
    Bt—28 to 37 inches; clay loam  
    BC—37 to 60 inches; gravelly sandy loam

#### **Additional Components**

Euell, stony and similar soils: 10 percent

### **503F—Bridger-Eastridge-Hungryhill complex, 25 to 60 percent slopes, very stony**

#### **Map Unit Setting**

*Interpretive focus:* Forestland and rangeland  
*Elevation:* 5,270 to 7,250 feet  
*Mean annual precipitation:* 15 to 17 inches  
*Frost-free period:* 50 to 70 days

#### **Component Description**

##### **Bridger, very stony and similar soils**

*Composition:* 35 percent  
*Geomorphic description:* Backslope on south-tending hill  
*Slope:* 25 to 50 percent, east to northwest aspects  
*Elevation:* 5,270 to 7,250 feet  
*Effective annual precipitation:* 12 to 15 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Loam  
*Rock fragments on the soil surface:* 0.10 to 3.00 percent boulders, 10 to 50 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Alluvium derived from volcanic rock  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 7.9 inches  
*Typical profile:*  
    A1—0 to 3 inches; loam  
    A2—3 to 9 inches; loam  
    Bt—9 to 17 inches; clay

Bk—17 to 34 inches; loam  
C—34 to 60 inches; sandy loam

**Eastridge, very stony and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Backslope on forested steeper north-tending hill

*Slope:* 30 to 60 percent, west to east aspects

*Elevation:* 5,270 to 7,250 feet

*Effective annual precipitation:* 17 to 20 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly ashy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent boulders, 10 to 50 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Volcanic ash-influenced alluvium and/or colluvium

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 4.6 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

E1—2 to 7 inches; gravelly ashy loam

E2—7 to 11 inches; very gravelly ashy sandy loam

E/Bt—11 to 15 inches; very cobbly ashy sandy clay loam

Bt—15 to 31 inches; very gravelly ashy sandy clay loam

BC—31 to 60 inches; very gravelly ashy sandy loam

**Hungryhill, very stony and similar soils**

*Composition:* 20 percent

*Geomorphic description:*

- Backslope on grassy south-tending hill
- Shoulder on grassy south-tending hill

*Slope:* 30 to 50 percent, east to northwest aspects

*Elevation:* 5,270 to 7,250 feet

*Effective annual precipitation:* 12 to 15 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent boulders, 10 to 50 feet apart

*Depth to restrictive feature:* Lithic bedrock: 20 to 40 inches

*Drainage class:* Well drained

*Parent material:* Loamy skeletal colluvium over volcanic and sedimentary rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.2 inches

*Typical profile:*

A1—0 to 4 inches; gravelly loam

A2—4 to 11 inches; gravelly loam

Bt—11 to 20 inches; very gravelly sandy clay loam

BC—20 to 31 inches; very gravelly sandy loam

R—31 to 60 inches; bedrock

**Additional Components**

Bullrey and similar soils: 10 percent

Rock outcrop: 10 percent

Euell, very stony and similar soils: 5 percent

## **504E—Bullrey-Hungryhill-Larkspur complex, 8 to 30 percent slopes, very stony**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,380 to 7,510 feet

*Mean annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Bullrey, very stony and similar soils**

*Composition:* 40 percent

*Geomorphic description:* Backslope on mountain

*Slope:* 8 to 25 percent

*Elevation:* 5,380 to 7,510 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium and/or colluvium derived from rhyolite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.4 inches

*Typical profile:*

A1—0 to 7 inches; gravelly loam

A2—7 to 15 inches; very gravelly loam

Bw—15 to 24 inches; very gravelly loam

C—24 to 60 inches; very gravelly sandy loam

#### **Hungryhill, very stony and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Backslope on mountain

*Slope:* 15 to 30 percent

*Elevation:* 5,380 to 7,510 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* Lithic bedrock: 20 to 40 inches

*Drainage class:* Well drained

*Parent material:* Loamy skeletal colluvium over volcanic and sedimentary rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.2 inches

*Typical profile:*

A1—0 to 4 inches; gravelly loam

A2—4 to 11 inches; gravelly loam

Bt—11 to 20 inches; very gravelly sandy clay loam

BC—20 to 31 inches; very gravelly sandy loam

R—31 to 60 inches; bedrock



**Larkspur, very stony and similar soils**

*Composition:* 20 percent

*Geomorphic description:*

- Summit on mountain
- Shoulder on mountain

*Slope:* 15 to 30 percent

*Elevation:* 5,380 to 7,510 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very cobbly coarse sandy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* Lithic bedrock: 3 to 10 inches

*Drainage class:* Well drained

*Parent material:* Colluvium and/or residuum over volcanic and sedimentary rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 0.6 inches

*Typical profile:*

A—0 to 4 inches; very cobbly coarse sandy loam

C—4 to 9 inches; very cobbly coarse sandy loam

R—9 to 60 inches; bedrock

**Additional Components**

Rock outcrop: 5 percent

**505E—Chinasprings-Euell-Nissler complex, 8 to 30 percent slopes, stony**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,360 to 5,870 feet

*Mean annual precipitation:* 12 to 14 inches

*Frost-free period:* 55 to 90 days

**Component Description**

**Chinasprings, stony and similar soils**

*Composition:* 40 percent

*Geomorphic description:* Backslope on south-tending hill

*Slope:* 8 to 30 percent, east to northwest aspects

*Elevation:* 5,360 to 5,870 feet

*Effective annual precipitation:* 11 to 13 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Gravelly ashy sandy loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* Paralithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Volcanic ash-influenced alluvium over volcanic and sedimentary rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.9 inches

*Typical profile:*

A—0 to 6 inches; gravelly ashy sandy loam

Bt—6 to 20 inches; gravelly ashy sandy clay loam

Bk—20 to 44 inches; ashy gravelly sandy loam  
BCk—44 to 58 inches; gravelly ashy sandy loam  
Cr—58 to 79 inches; ashy bedrock

**Euell, stony, moderately deep and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Backslope on north-tending hill

*Slope:* 15 to 30 percent, west to east aspects

*Elevation:* 5,360 to 5,870 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 55 to 75 days

*Surface layer texture:* Very cobbly ashy loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 40 to 67 inches

*Drainage class:* Well drained

*Parent material:* Residuum over welded tuff

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.1 inches

*Typical profile:*

A—0 to 9 inches; very cobbly ashy loam

Bt—9 to 19 inches; very gravelly ashy sandy clay loam

BC—19 to 38 inches; very cobbly ashy loam

Cr—38 to 45 inches; bedrock

R—45 to 61 inches; bedrock

**Nissler, stony and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Backslope on north-tending forested hill

*Slope:* 15 to 30 percent, west to east aspects

*Elevation:* 5,360 to 5,870 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 55 to 75 days

*Surface layer texture:* Ashy sandy loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* Lithic bedrock: 60 to 79 inches

*Drainage class:* Well drained

*Parent material:* Colluvium derived from volcanic rock

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 5.9 inches

*Typical profile:*

A—0 to 8 inches; ashy sandy loam

Bt—8 to 22 inches; ashy sandy clay loam

BC—22 to 60 inches; gravelly ashy sandy loam

R—60 to 70 inches; bedrock

**Additional Components**

Whitlash, very stony and similar soils: 10 percent

Rock outcrop: 5 percent

## **507C—Chinasprings ashy sandy loam, 2 to 8 percent slopes, stony, moderately impacted**

### **Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,150 to 5,580 feet  
*Mean annual precipitation:* 12 to 14 inches  
*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Chinasprings, moderately impacted, stony and similar soils**

*Composition:* 80 percent  
*Geomorphic description:* Alluvial fan  
*Slope:* 2 to 8 percent  
*Elevation:* 5,150 to 5,580 feet  
*Effective annual precipitation:* 12 to 14 inches  
*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Ashy sandy loam  
*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Volcanic ash-influenced alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 6.0 inches  
*Typical profile:*  
    A1—0 to 0 inches; ashy sandy loam  
    A2—0 to 6 inches; ashy sandy loam  
    Bt—6 to 16 inches; gravelly ashy sandy clay loam  
    Bk1—16 to 24 inches; gravelly ashy sandy loam  
    Bk2—24 to 40 inches; ashy gravelly sandy loam  
    BCk—40 to 80 inches; gravelly ashy sandy loam

### **Additional Components**

Patouza, moderately impacted, stony and similar soils: 10 percent  
Chinasprings, moderately impacted, very stony, greater slopes and similar soils: 5 percent  
Travona, moderately impacted and similar soils: 5 percent

## **508F—Eastridge-Judco complex, 20 to 60 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Forestland  
*Elevation:* 5,590 to 6,890 feet  
*Mean annual precipitation:* 15 to 19 inches  
*Frost-free period:* 30 to 50 days

### **Component Description**

#### **Eastridge and similar soils**

*Composition:* 70 percent  
*Geomorphic description:* Side slope on north-tending slopes on mountain

*Slope:* 20 to 50 percent, west to southeast aspects  
*Elevation:* 5,590 to 6,890 feet  
*Effective annual precipitation:* 18 to 22 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Gravelly ashy loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Volcanic ash-influenced alluvium and/or colluvium  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 4.6 inches  
*Typical profile:*  
    Oi—0 to 2 inches; slightly decomposed plant material  
    E1—2 to 7 inches; gravelly ashy loam  
    E2—7 to 11 inches; very gravelly ashy sandy loam  
    E/Bt—11 to 15 inches; very cobbly ashy sandy clay loam  
    Bt—15 to 31 inches; very gravelly ashy sandy clay loam  
    BC—31 to 60 inches; very gravelly ashy sandy loam

**Judco and similar soils**

*Composition:* 15 percent  
*Geomorphic description:* Side slope on north-tending slopes on mountain  
*Slope:* 45 to 60 percent, west to southeast aspects  
*Elevation:* 5,590 to 6,890 feet  
*Effective annual precipitation:* 18 to 22 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Gravelly ashy loam  
*Depth to restrictive feature:* Paralithic bedrock: 40 to 60 inches  
*Drainage class:* Well drained  
*Parent material:* Colluvium and/or residuum over rhyolite and/or welded tuff  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 3.4 inches  
*Typical profile:*  
    Oi—0 to 2 inches; slightly decomposed plant material  
    A—2 to 10 inches; gravelly ashy loam  
    Bw—10 to 18 inches; very gravelly ashy sandy clay loam  
    BC—18 to 52 inches; very gravelly ashy sandy loam  
    Cr—52 to 60 inches; bedrock

**Additional Components**

Vitroff and similar soils: 9 percent  
Coslaw, very stony and similar soils: 5 percent  
Rock outcrop: 1 percent

**509D—Bridger-Nissler complex, 4 to 15 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,300 to 6,040 feet  
*Mean annual precipitation:* 13 to 16 inches  
*Frost-free period:* 50 to 70 days

## Component Description

### **Bridger and similar soils**

*Composition:* 55 percent

*Geomorphic description:* Backslope on hill

*Slope:* 8 to 15 percent

*Elevation:* 5,300 to 6,040 feet

*Effective annual precipitation:* 13 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Clay loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium and/or colluvium derived from volcanic rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 7.1 inches

*Typical profile:*

A—0 to 4 inches; clay loam

Bt—4 to 17 inches; clay

Btk—17 to 21 inches; gravelly clay loam

Bk1—21 to 29 inches; very gravelly sandy clay loam

Bk2—29 to 60 inches; very gravelly sandy clay loam

### **Nissler and similar soils**

*Composition:* 30 percent

*Geomorphic description:*

- Footslope on hill
- Swale

*Slope:* 4 to 12 percent

*Elevation:* 5,300 to 6,040 feet

*Effective annual precipitation:* 13 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Ashy loam

*Depth to restrictive feature:* Lithic bedrock: 60 to 79 inches

*Drainage class:* Well drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.9 inches

*Typical profile:*

A—0 to 8 inches; ashy loam

Bt—8 to 22 inches; ashy sandy clay loam

BC—22 to 60 inches; gravelly ashy sandy loam

R—60 to 70 inches; bedrock

## Additional Components

Chinasprings and similar soils: 12 percent

Rock outcrop: 3 percent

## **510F—Euell, very stony-Hungryhill, very stony-Rock outcrop complex, 30 to 60 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Forestland and rangeland

*Elevation:* 5,150 to 6,890 feet

*Mean annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Euell, very stony, moderately deep and similar soils**

*Composition:* 40 percent

*Geomorphic description:* Backslope on north-tending mountain slope

*Slope:* 30 to 60 percent, west to east aspects

*Elevation:* 5,150 to 6,890 feet

*Effective annual precipitation:* 17 to 21 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very cobbly ashy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 10 to 40 feet apart

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 40 to 67 inches

*Drainage class:* Well drained

*Parent material:* Residuum over welded tuff

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 3.1 inches

*Typical profile:*

A—0 to 9 inches; very cobbly ashy loam

Bt—9 to 19 inches; very gravelly ashy sandy clay loam

BC—19 to 38 inches; very cobbly ashy loam

Cr—38 to 45 inches; bedrock

R—45 to 61 inches; bedrock

#### **Hungryhill, very stony and similar soils**

*Composition:* 25 percent

*Geomorphic description:* Backslope on north-tending mountain slope

*Slope:* 30 to 60 percent, west to east aspects

*Elevation:* 5,150 to 6,890 feet

*Effective annual precipitation:* 17 to 21 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very gravelly loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 10 to 40 feet apart

*Depth to restrictive feature:* Lithic bedrock: 20 to 40 inches

*Drainage class:* Well drained

*Parent material:* Loamy skeletal colluvium over volcanic and sedimentary rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.2 inches

*Typical profile:*

A1—0 to 4 inches; very gravelly loam

A2—4 to 11 inches; gravelly loam

Bt—11 to 20 inches; very gravelly sandy clay loam

BC—20 to 31 inches; very gravelly sandy loam

R—31 to 60 inches; bedrock

**Illiano, rubbly and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Shoulder on north-tending mountain slope

*Slope:* 20 to 50 percent, west to east aspects

*Elevation:* 5,150 to 6,890 feet

*Effective annual precipitation:* 17 to 21 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very flaggy sandy loam

*Rock fragments on the soil surface:* 15 to 40 percent stones, 2 to 13 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Well drained

*Parent material:* Residuum over welded tuff and/or rhyolite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 0.9 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

A—1 to 6 inches; very flaggy sandy loam

Bw—6 to 17 inches; very cobbly sandy loam

R—17 to 60 inches; bedrock

**Rock outcrop**

*Composition:* 15 percent

**Additional Components**

Rubble land: 5 percent

**511E—Hungryhill-Euell-Larkspur complex, 8 to 30 percent slopes, stony**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,400 to 6,120 feet

*Mean annual precipitation:* 14 to 17 inches

*Frost-free period:* 50 to 70 days

**Component Description**

**Hungryhill, stony and similar soils**

*Composition:* 45 percent

*Geomorphic description:* Backslope on hill

*Slope:* 15 to 30 percent

*Elevation:* 5,400 to 6,120 feet

*Effective annual precipitation:* 14 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 30 to 100 feet apart

*Depth to restrictive feature:* Lithic bedrock: 20 to 40 inches

*Drainage class:* Well drained

*Parent material:* Loamy skeletal colluvium over volcanic and sedimentary rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.2 inches

*Typical profile:*

A1—0 to 4 inches; gravelly loam

A2—4 to 11 inches; gravelly loam

Bt—11 to 20 inches; very gravelly sandy clay loam

BC—20 to 31 inches; very gravelly sandy loam

R—31 to 60 inches; bedrock

**Euell, stony and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Footslope on hill

*Slope:* 8 to 20 percent

*Elevation:* 5,400 to 6,120 feet

*Effective annual precipitation:* 14 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly ashy loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 30 to 100 feet apart

*Depth to restrictive feature:* Lithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Loamy skeletal colluvium over volcanic rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.1 inches

*Typical profile:*

A—0 to 10 inches; gravelly ashy loam

Bt—10 to 26 inches; very gravelly ashy sandy clay loam

BC—26 to 58 inches; very gravelly ashy sandy loam

R—58 to 60 inches; bedrock

**Larkspur, stony and similar soils**

*Composition:* 20 percent

*Geomorphic description:*

- Shoulder on hill
- Summit on hill

*Slope:* 8 to 30 percent

*Elevation:* 5,400 to 6,120 feet

*Effective annual precipitation:* 14 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very channery loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 30 to 100 feet apart

*Depth to restrictive feature:* Lithic bedrock: 3 to 10 inches

*Drainage class:* Well drained

*Parent material:* Colluvium and/or residuum over volcanic and sedimentary rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 0.6 inches

*Typical profile:*

A—0 to 4 inches; very channery loam

C—4 to 9 inches; very cobbly coarse sandy loam

R—9 to 60 inches; bedrock



### **Additional Components**

Rock outcrop: 5 percent

## **512E—Euell-Larkspur complex, 8 to 30 percent slopes, stony, moderately impacted**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,200 to 6,090 feet

*Mean annual precipitation:* 13 to 17 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Euell, moderately impacted, stony and similar soils**

*Composition:* 60 percent

*Geomorphic description:* Backslope on hill

*Slope:* 8 to 25 percent

*Elevation:* 5,200 to 6,090 feet

*Effective annual precipitation:* 13 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly ashy loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 30 to 100 feet apart

*Depth to restrictive feature:* Lithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Loamy skeletal colluvium over volcanic rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.1 inches

*Typical profile:*

A1—0 to 0 inches; gravelly ashy loam

A2—0 to 10 inches; gravelly ashy loam

Bt—10 to 26 inches; very gravelly ashy sandy clay loam

BC—26 to 58 inches; very gravelly ashy sandy loam

R—58 to 60 inches; bedrock

#### **Larkspur, moderately impacted, stony and similar soils**

*Composition:* 25 percent

*Geomorphic description:*

- Shoulder on hill
- Summit on hill

*Slope:* 8 to 30 percent

*Elevation:* 5,200 to 6,090 feet

*Effective annual precipitation:* 13 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very channery loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 30 to 100 feet apart

*Depth to restrictive feature:* Lithic bedrock: 3 to 10 inches

*Drainage class:* Well drained

*Parent material:* Colluvium and/or residuum over volcanic and sedimentary rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 0.6 inches

*Typical profile:*

- A1—0 to 0 inches; very channery loam
- A2—0 to 4 inches; very channery loam
- C—4 to 9 inches; very cobbly coarse sandy loam
- R—9 to 60 inches; bedrock

**Additional Components**

Euell, stony, moderately deep and similar soils: 10 percent  
Rock outcrop: 5 percent

**513E—Euell, very stony-Illiano, moderately impacted,  
very stony-Rock outcrop complex, 8 to 30 percent  
slopes**

**Map Unit Setting**

*Interpretive focus:* Forestland and rangeland  
*Elevation:* 5,120 to 6,680 feet  
*Mean annual precipitation:* 14 to 16 inches  
*Frost-free period:* 50 to 70 days

**Component Description**

**Euell, very stony, moderately deep and similar soils**

*Composition:* 40 percent  
*Geomorphic description:* Backslope on hill  
*Slope:* 15 to 30 percent  
*Elevation:* 5,120 to 6,680 feet  
*Effective annual precipitation:* 13 to 17 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Very cobbly ashy loam  
*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 10 to 40 feet apart  
*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 40 to 67 inches

*Drainage class:* Well drained  
*Parent material:* Residuum over welded tuff  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 3.1 inches  
*Typical profile:*

- A1—0 to 0 inches; very cobbly ashy loam
- A2—0 to 9 inches; very cobbly ashy loam
- Bt—9 to 19 inches; very gravelly ashy sandy clay loam
- BC—19 to 38 inches; very cobbly ashy loam
- Cr—38 to 45 inches; bedrock
- R—45 to 61 inches; bedrock

**Illiano, moderately impacted, very stony and similar soils**

*Composition:* 35 percent  
*Geomorphic description:*

- Summit on hill
- Shoulder on hill

*Slope:* 8 to 25 percent

*Elevation:* 5,120 to 6,680 feet  
*Effective annual precipitation:* 13 to 17 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Very flaggy sandy loam  
*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 10 to 40 feet apart  
*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches  
*Drainage class:* Well drained  
*Parent material:* Residuum over welded tuff and/or rhyolite  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 0.9 inches  
*Typical profile:*  
    Oi—0 to 1 inches; slightly decomposed plant material  
    A1—1 to 2 inches; very flaggy sandy loam  
    A2—2 to 6 inches; very flaggy sandy loam  
    Bw—6 to 17 inches; very cobbly sandy loam  
    R—17 to 60 inches; bedrock

**Rock outcrop**

*Composition:* 15 percent

**Additional Components**

Bullrey, moderately impacted and similar soils: 10 percent

**514E—Hungryhill-Euell-Poin complex, 8 to 35 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,540 to 6,870 feet  
*Mean annual precipitation:* 15 to 19 inches  
*Frost-free period:* 50 to 70 days

**Component Description**

**Hungryhill and similar soils**

*Composition:* 45 percent  
*Geomorphic description:* Backslope on south-tending mountain slope  
*Slope:* 15 to 35 percent, east to northwest aspects  
*Elevation:* 5,540 to 6,870 feet  
*Effective annual precipitation:* 14 to 16 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Channery loam  
*Depth to restrictive feature:* Lithic bedrock: 20 to 40 inches  
*Drainage class:* Well drained  
*Parent material:* Loamy skeletal colluvium over volcanic and sedimentary rock  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 3.2 inches  
*Typical profile:*  
    A1—0 to 4 inches; channery loam  
    A2—4 to 11 inches; gravelly loam  
    Bt—11 to 20 inches; very gravelly sandy clay loam

BC—20 to 31 inches; very gravelly sandy loam

R—31 to 60 inches; bedrock

**Euell and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Backslope on north-tending mountain slope

*Slope:* 15 to 30 percent, west to east aspects

*Elevation:* 5,540 to 6,870 feet

*Effective annual precipitation:* 18 to 21 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly ashy loam

*Depth to restrictive feature:* Lithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Loamy skeletal colluvium over volcanic rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.1 inches

*Typical profile:*

A—0 to 10 inches; gravelly ashy loam

Bt—10 to 26 inches; very gravelly ashy sandy clay loam

BC—26 to 58 inches; very gravelly ashy sandy loam

R—58 to 60 inches; bedrock

**Poin and similar soils**

*Composition:* 15 percent

*Geomorphic description:*

- Shoulder on mountain slope
- Summit on mountain slope

*Slope:* 8 to 25 percent

*Elevation:* 5,540 to 6,870 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very cobbly sandy loam

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Well drained

*Parent material:* Colluvium and/or residuum over volcanic rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.1 inches

*Typical profile:*

A—0 to 5 inches; very cobbly sandy loam

Bw—5 to 13 inches; very cobbly sandy loam

C—13 to 15 inches; very cobbly coarse sandy loam

R—15 to 60 inches; bedrock

**Additional Components**

Bullrey and similar soils: 7 percent

Savenac and similar soils: 2 percent

Rock outcrop: 1 percent

## **515F—Eastridge-Hungryhill-Poin complex, 20 to 50 percent slopes, very stony**

### **Map Unit Setting**

*Interpretive focus:* Forestland and rangeland

*Elevation:* 5,300 to 7,120 feet

*Mean annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Eastridge, very stony and similar soils**

*Composition:* 65 percent

*Geomorphic description:* Backslope on south-tending mountain slope

*Slope:* 20 to 50 percent, east to northwest aspects

*Elevation:* 5,300 to 7,120 feet

*Effective annual precipitation:* 12 to 15 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very cobbly ashy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 10 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Volcanic ash-influenced alluvium and/or colluvium

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 4.6 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

E1—2 to 7 inches; very cobbly ashy loam

E2—7 to 11 inches; very gravelly ashy sandy loam

E/Bt—11 to 15 inches; very cobbly ashy sandy clay loam

Bt—15 to 31 inches; very gravelly ashy sandy clay loam

BC—31 to 60 inches; very gravelly ashy sandy loam

#### **Hungryhill, very stony and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Backslope on south-tending mountain slope

*Slope:* 20 to 50 percent, east to northwest aspects

*Elevation:* 5,300 to 7,120 feet

*Effective annual precipitation:* 12 to 15 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very gravelly loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 10 to 40 feet apart

*Depth to restrictive feature:* Lithic bedrock: 20 to 40 inches

*Drainage class:* Well drained

*Parent material:* Loamy skeletal colluvium over volcanic and sedimentary rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.2 inches

*Typical profile:*

A1—0 to 4 inches; very gravelly loam

A2—4 to 11 inches; gravelly loam

Bt—11 to 20 inches; very gravelly sandy clay loam

BC—20 to 31 inches; very gravelly sandy loam

R—31 to 60 inches; bedrock

**Poin, very stony and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Shoulder on south-tending mountain slope

*Slope:* 20 to 45 percent, east to northwest aspects

*Elevation:* 5,300 to 7,120 feet

*Effective annual precipitation:* 12 to 15 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very cobbly sandy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 10 to 40 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Well drained

*Parent material:* Colluvium and/or residuum over volcanic rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.1 inches

*Typical profile:*

A—0 to 5 inches; very cobbly sandy loam

Bw—5 to 13 inches; very cobbly sandy loam

C—13 to 15 inches; very cobbly coarse sandy loam

R—15 to 60 inches; bedrock

**Additional Components**

Eastridge, very stony, moist and similar soils: 4 percent

Rock outcrop: 1 percent

**516F—Eastridge-Germangulch complex, 25 to 60 percent slopes, very stony**

**Map Unit Setting**

*Interpretive focus:* Forestland

*Elevation:* 5,150 to 6,860 feet

*Mean annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

**Component Description**

**Eastridge, very stony and similar soils**

*Composition:* 45 percent

*Geomorphic description:* Backslope on north-tending hill

*Slope:* 25 to 60 percent, west to southeast aspects

*Elevation:* 5,150 to 6,860 feet

*Effective annual precipitation:* 16 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly ashy sandy loam

*Rock fragments on the soil surface:* 0.10 to 5.00 percent boulders, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Volcanic ash-influenced alluvium and/or colluvium

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 4.6 inches

*Typical profile:*

- Oi—0 to 2 inches; slightly decomposed plant material
- E1—2 to 7 inches; gravelly ashy sandy loam
- E2—7 to 11 inches; very gravelly ashy sandy loam
- E/Bt—11 to 15 inches; very cobbly ashy sandy clay loam
- Bt—15 to 31 inches; very gravelly ashy sandy clay loam
- BC—31 to 60 inches; very gravelly ashy sandy loam

**Germangulch, very stony and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Backslope on north-tending hill

*Slope:* 25 to 60 percent, west to southeast aspects

*Elevation:* 5,150 to 6,860 feet

*Effective annual precipitation:* 16 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly ashy sandy loam

*Rock fragments on the soil surface:* 0.10 to 5.00 percent boulders, 7 to 40 feet apart

*Depth to restrictive feature:* Paralithic bedrock: 20 to 40 inches

*Drainage class:* Well drained

*Parent material:* Loamy colluvium over volcanic rock

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 4.0 inches

*Typical profile:*

- Oi—0 to 2 inches; slightly decomposed plant material
- E—2 to 10 inches; gravelly ashy sandy loam
- Bt—10 to 24 inches; cobbly loam
- BC—24 to 31 inches; very gravelly sandy loam
- Cr—31 to 60 inches; bedrock

**Additional Components**

Coslaw, very stony and similar soils: 10 percent

Larkspur, very stony and similar soils: 6 percent

Rock outcrop: 4 percent

**517D—Poin-Larkspur complex, 4 to 20 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,360 to 6,530 feet

*Mean annual precipitation:* 12 to 14 inches

*Frost-free period:* 50 to 70 days

**Component Description**

**Poin and similar soils**

*Composition:* 70 percent

*Geomorphic description:*

- Shoulder on hill
- Backslope on hill

*Slope:* 8 to 20 percent

*Elevation:* 5,360 to 6,530 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Very channery sandy loam  
*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches  
*Drainage class:* Well drained  
*Parent material:* Colluvium and/or residuum over volcanic rock  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 1.1 inches  
*Typical profile:*  
A—0 to 5 inches; very channery sandy loam  
Bw—5 to 13 inches; very cobbly sandy loam  
C—13 to 15 inches; very cobbly coarse sandy loam  
R—15 to 60 inches; bedrock

**Larkspur and similar soils**

*Composition:* 25 percent  
*Geomorphic description:*

- Summit on hill
- Shoulder on hill

*Slope:* 4 to 12 percent  
*Elevation:* 5,360 to 6,530 feet  
*Effective annual precipitation:* 12 to 14 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Very channery sandy loam  
*Depth to restrictive feature:* Lithic bedrock: 3 to 10 inches  
*Drainage class:* Well drained  
*Parent material:* Colluvium and/or residuum over volcanic and sedimentary rock  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 0.6 inches  
*Typical profile:*  
A—0 to 4 inches; very channery sandy loam  
C—4 to 9 inches; very cobbly coarse sandy loam  
R—9 to 60 inches; bedrock

**Additional Components**

Rock outcrop: 5 percent

**518F—Germangulch-Eastridge-Euell complex, 25 to 60 percent slopes, very stony**

**Map Unit Setting**

*Interpretive focus:* Forestland  
*Elevation:* 5,130 to 6,920 feet  
*Mean annual precipitation:* 15 to 19 inches  
*Frost-free period:* 50 to 70 days

**Component Description**

**Germangulch, very stony and similar soils**

*Composition:* 40 percent  
*Geomorphic description:* Backslope on north-tending mountain slope  
*Slope:* 30 to 60 percent, west to southeast aspects



*Elevation:* 5,130 to 6,920 feet  
*Effective annual precipitation:* 18 to 21 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Gravelly ashy sandy loam  
*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart  
*Depth to restrictive feature:* Paralithic bedrock: 20 to 40 inches  
*Drainage class:* Well drained  
*Parent material:* Loamy colluvium over volcanic rock  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 4.0 inches  
*Typical profile:*  
    Oi—0 to 2 inches; slightly decomposed plant material  
    E—2 to 10 inches; gravelly ashy sandy loam  
    Bt—10 to 24 inches; cobbly loam  
    BC—24 to 31 inches; very gravelly sandy loam  
    Cr—31 to 60 inches; bedrock

**Eastridge, very stony and similar soils**

*Composition:* 30 percent  
*Geomorphic description:* Backslope on north-tending mountain slope  
*Slope:* 25 to 50 percent, west to southeast aspects  
*Elevation:* 5,130 to 6,920 feet  
*Effective annual precipitation:* 18 to 21 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Gravelly ashy loam  
*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Volcanic ash-influenced alluvium and/or colluvium  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 4.6 inches  
*Typical profile:*  
    Oi—0 to 2 inches; slightly decomposed plant material  
    E1—2 to 7 inches; gravelly ashy loam  
    E2—7 to 11 inches; very gravelly ashy sandy loam  
    E/Bt—11 to 15 inches; very cobbly ashy sandy clay loam  
    Bt—15 to 31 inches; very gravelly ashy sandy clay loam  
    BC—31 to 60 inches; very gravelly ashy sandy loam

**Euell, very stony and similar soils**

*Composition:* 15 percent  
*Geomorphic description:* Backslope on north-tending mountain slope  
*Slope:* 25 to 50 percent, west to southeast aspects  
*Elevation:* 5,130 to 6,920 feet  
*Effective annual precipitation:* 18 to 21 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Gravelly ashy sandy loam  
*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart  
*Depth to restrictive feature:* Lithic bedrock: 40 to 60 inches  
*Drainage class:* Well drained  
*Parent material:* Loamy skeletal colluvium over volcanic rock  
*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 5.1 inches

*Typical profile:*

A—0 to 10 inches; gravelly ashy sandy loam

Bt—10 to 26 inches; very gravelly ashy sandy clay loam

BC—26 to 58 inches; very gravelly ashy sandy loam

R—58 to 60 inches; bedrock

### **Additional Components**

Poin, very stony and similar soils: 10 percent

Rock outcrop: 5 percent

## **519E—Eastridge-Euell complex, 15 to 30 percent slopes, very stony**

### **Map Unit Setting**

*Interpretive focus:* Forestland and rangeland

*Elevation:* 5,270 to 6,810 feet

*Mean annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Eastridge, very stony and similar soils**

*Composition:* 75 percent

*Geomorphic description:* Backslope on north-tending mountain slope

*Slope:* 15 to 30 percent, west to southeast aspects

*Elevation:* 5,270 to 6,810 feet

*Effective annual precipitation:* 16 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly ashy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Volcanic ash-influenced alluvium and/or colluvium

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 4.6 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

E1—2 to 7 inches; gravelly ashy loam

E2—7 to 11 inches; very gravelly ashy sandy loam

E/Bt—11 to 15 inches; very cobbly ashy sandy clay loam

Bt—15 to 31 inches; very gravelly ashy sandy clay loam

BC—31 to 60 inches; very gravelly ashy sandy loam

#### **Euell, very stony and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Backslope on north-tending mountain slope

*Slope:* 15 to 30 percent, west to southeast aspects

*Elevation:* 5,270 to 6,810 feet

*Effective annual precipitation:* 16 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly ashy sandy loam  
*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart  
*Depth to restrictive feature:* Lithic bedrock: 40 to 60 inches  
*Drainage class:* Well drained  
*Parent material:* Loamy skeletal colluvium over volcanic rock  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 5.1 inches  
*Typical profile:*  
A—0 to 10 inches; gravelly ashy sandy loam  
Bt—10 to 26 inches; very gravelly ashy sandy clay loam  
BC—26 to 58 inches; very gravelly ashy sandy loam  
R—58 to 60 inches; bedrock

#### **Additional Components**

Coslaw, very stony and similar soils: 7 percent  
Rock outcrop: 3 percent

### **522D—Foolhen, rarely flooded-Silas-Vitroff complex, 2 to 15 percent slopes**

#### **Map Unit Setting**

*Interpretive focus:* Riparian  
*Elevation:* 5,590 to 6,890 feet  
*Mean annual precipitation:* 15 to 19 inches  
*Frost-free period:* 50 to 70 days

#### **Component Description**

##### **Foolhen and similar soils**

*Composition:* 40 percent  
*Geomorphic description:* Lower edges of drainageway  
*Slope:* 2 to 4 percent  
*Elevation:* 5,590 to 6,890 feet  
*Effective annual precipitation:* 15 to 19 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Mucky peat  
*Depth to restrictive feature:* None noted  
*Drainage class:* Poorly drained  
*Parent material:* Mixed alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* Rare  
*Water table:* Present  
*Available water capacity:* Mainly 7.5 inches  
*Typical profile:*  
Oe—0 to 4 inches; mucky peat  
A—4 to 16 inches; loam  
Bw—16 to 40 inches; sandy clay loam  
Cg—40 to 72 inches; gravelly coarse sandy loam

##### **Silas and similar soils**

*Composition:* 30 percent  
*Geomorphic description:* Higher edges of drainageway

*Slope:* 2 to 8 percent  
*Elevation:* 5,590 to 6,890 feet  
*Effective annual precipitation:* 15 to 19 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Moderately well drained  
*Parent material:* Mixed alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Water table:* Present  
*Available water capacity:* Mainly 11.0 inches  
*Typical profile:*  
    Oe—0 to 2 inches; moderately decomposed plant material  
    A1—2 to 18 inches; loam  
    A2—18 to 38 inches; loam  
    C—38 to 72 inches; loam

**Vitroff and similar soils**

*Composition:* 20 percent  
*Geomorphic description:* Footslope on mountain slope  
*Slope:* 4 to 15 percent  
*Elevation:* 5,590 to 6,890 feet  
*Effective annual precipitation:* 15 to 19 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Ashy loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Tuffaceous colluvium and/or slope alluvium derived from volcanic rock  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 6.1 inches  
*Typical profile:*  
    Oi—0 to 2 inches; slightly decomposed plant material  
    E1—2 to 7 inches; ashy loam  
    E2—7 to 13 inches; gravelly ashy sandy loam  
    Bt and E—13 to 21 inches; gravelly ashy sandy clay loam  
    Bt—21 to 33 inches; gravelly ashy sandy clay loam  
    BC—33 to 60 inches; very gravelly ashy sandy loam

**Additional Components**

Mooseflat and similar soils: 10 percent

**523E—Nissler-Euell complex, 12 to 30 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,560 to 7,270 feet  
*Mean annual precipitation:* 16 to 20 inches  
*Frost-free period:* 50 to 70 days

### Component Description

#### **Nissler and similar soils**

*Composition:* 55 percent

*Geomorphic description:* Mountainflank on south-tending mountain slope

*Slope:* 12 to 30 percent, east to northwest aspects

*Elevation:* 5,560 to 7,270 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly ashy loam

*Depth to restrictive feature:* Lithic bedrock: 60 to 79 inches

*Drainage class:* Well drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.9 inches

*Typical profile:*

A—0 to 8 inches; gravelly ashy loam

Bt—8 to 22 inches; ashy sandy clay loam

BC—22 to 60 inches; gravelly ashy sandy loam

R—60 to 70 inches; bedrock

#### **Euell and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Mountainflank on south-tending mountain slope

*Slope:* 12 to 30 percent, east to northwest aspects

*Elevation:* 5,560 to 7,270 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly ashy sandy loam

*Depth to restrictive feature:* Lithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Loamy skeletal colluvium over volcanic rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.1 inches

*Typical profile:*

A—0 to 10 inches; gravelly ashy sandy loam

Bt—10 to 26 inches; very gravelly ashy sandy clay loam

BC—26 to 58 inches; very gravelly ashy sandy loam

R—58 to 60 inches; bedrock

### Additional Components

Bullrey and similar soils: 10 percent

## **525G—Eastridge gravelly ashy loam, 45 to 75 percent slopes**

### Map Unit Setting

*Interpretive focus:* Forestland

*Elevation:* 5,640 to 6,740 feet

*Mean annual precipitation:* 15 to 19 inches

*Frost-free period:* 30 to 50 days

### Component Description

#### **Eastridge and similar soils**

*Composition:* 85 percent

*Geomorphic description:* Backslope on north-tending mountain slope

*Slope:* 45 to 75 percent, west to southeast aspects

*Elevation:* 5,640 to 6,740 feet

*Effective annual precipitation:* 18 to 22 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Gravelly ashy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Volcanic ash-influenced alluvium and/or colluvium

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 4.6 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

E1—2 to 7 inches; gravelly ashy loam

E2—7 to 11 inches; very gravelly ashy sandy loam

E/Bt—11 to 15 inches; very cobbly ashy sandy clay loam

Bt—15 to 31 inches; very gravelly ashy sandy clay loam

BC—31 to 60 inches; very gravelly ashy sandy loam

### Additional Components

Illiano and similar soils: 13 percent

Rock outcrop: 2 percent

## **527E—Patouza-Nivean-Chinasprings complex, 8 to 30 percent slopes**

### Map Unit Setting

*Interpretive focus:* Rangeland and forestland

*Elevation:* 5,410 to 6,100 feet

*Mean annual precipitation:* 14 to 16 inches

*Frost-free period:* 70 to 90 days

### Component Description

#### **Patouza and similar soils**

*Composition:* 40 percent

*Geomorphic description:*

- Backslope on hill
- Footslope on hill

*Slope:* 8 to 20 percent

*Elevation:* 5,410 to 6,100 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* Paralithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Clayey alluvium over volcanic and sedimentary rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 8.5 inches

*Typical profile:*

- A—0 to 7 inches; loam
- Bt—7 to 19 inches; clay loam
- Bk—19 to 41 inches; loam
- BCk—41 to 57 inches; sandy clay loam
- Cr—57 to 60 inches; bedrock

#### **Nivean and similar soils**

*Composition:* 25 percent

*Geomorphic description:*

- Footslope on hill
- Backslope on hill

*Slope:* 12 to 25 percent

*Elevation:* 5,410 to 6,100 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Gravelly sandy loam

*Depth to restrictive feature:*

- Paralithic bedrock: 10 to 17 inches
- Lithic bedrock: 13 to 20 inches

*Drainage class:* Well drained

*Parent material:* Residuum over welded tuff and/or rhyolite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 0.8 inches

*Typical profile:*

- A—0 to 4 inches; gravelly sandy loam
- Bw—4 to 10 inches; very gravelly sandy loam
- BC—10 to 13 inches; extremely gravelly coarse sandy loam
- Cr—13 to 17 inches; bedrock
- R—17 to 60 inches; bedrock

#### **Chinasprings and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Backslope on hill

*Slope:* 15 to 30 percent

*Elevation:* 5,410 to 6,100 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Ashy loam

*Depth to restrictive feature:* Paralithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Volcanic ash-influenced alluvium over volcanic and sedimentary rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.9 inches

*Typical profile:*

- A—0 to 6 inches; ashy loam
- Bt—6 to 20 inches; gravelly ashy sandy clay loam
- Bk—20 to 44 inches; ashy gravelly sandy loam
- BCk—44 to 58 inches; gravelly ashy sandy loam
- Cr—58 to 79 inches; ashy bedrock

### **Additional Components**

Travona and similar soils: 8 percent

Rock outcrop: 7 percent

## **528E—Poin-Rock outcrop-Euell complex, 8 to 30 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Forestland and rangeland

*Elevation:* 5,460 to 6,590 feet

*Mean annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Poin and similar soils**

*Composition:* 45 percent

*Geomorphic description:* Backslope on hill

*Slope:* 8 to 30 percent

*Elevation:* 5,460 to 6,590 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very gravelly sandy loam

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Well drained

*Parent material:* Colluvium and/or residuum over volcanic rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.1 inches

*Typical profile:*

A—0 to 5 inches; very gravelly sandy loam

Bw—5 to 13 inches; very cobbly sandy loam

C—13 to 15 inches; very cobbly coarse sandy loam

R—15 to 60 inches; bedrock

#### **Rock outcrop**

*Composition:* 30 percent

#### **Euell and similar soils**

*Composition:* 15 percent

*Geomorphic description:*

- Footslope on hill
- Swale

*Slope:* 8 to 20 percent

*Elevation:* 5,460 to 6,590 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly ashy sandy loam

*Depth to restrictive feature:* Lithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Loamy skeletal colluvium over volcanic rock

*Native plant cover type:* Rangeland

*Flooding:* None



*Available water capacity:* Mainly 5.1 inches

*Typical profile:*

A—0 to 10 inches; gravelly ashy sandy loam

Bt—10 to 26 inches; very gravelly ashy sandy clay loam

BC—26 to 58 inches; very gravelly ashy sandy loam

R—58 to 60 inches; bedrock

### **Additional Components**

Larkspur and similar soils: 10 percent

## **530E—Bigbutte, stony-Poin, stony-Browns gulch complex, 8 to 25 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,200 to 5,990 feet

*Mean annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Bigbutte, stony and similar soils**

*Composition:* 45 percent

*Geomorphic description:* Backslope on south-tending hill

*Slope:* 8 to 20 percent, east to northwest aspects

*Elevation:* 5,200 to 5,990 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Ashy sandy loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 28 to 60 inches

*Drainage class:* Well drained

*Parent material:* Volcanic ash-influenced colluvium over volcanic and sedimentary rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.3 inches

*Typical profile:*

A—0 to 8 inches; ashy sandy loam

Bw—8 to 17 inches; gravelly ashy sandy loam

BC—17 to 30 inches; gravelly ashy sandy loam

Cr—30 to 36 inches; bedrock

R—36 to 60 inches; bedrock

#### **Poin, stony and similar soils**

*Composition:* 20 percent

*Geomorphic description:*

- Summit on south-tending hill
- Shoulder on south-tending hill

*Slope:* 8 to 25 percent, east to northwest aspects

*Elevation:* 5,200 to 5,990 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very cobbly sandy loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Well drained

*Parent material:* Colluvium and/or residuum over volcanic rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.1 inches

*Typical profile:*

A—0 to 5 inches; very cobbly sandy loam

Bw—5 to 13 inches; very cobbly sandy loam

C—13 to 15 inches; very cobbly coarse sandy loam

R—15 to 60 inches; bedrock

### **Browns gulch and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Foothills on south-trending hill

*Slope:* 8 to 15 percent, east to northwest aspects

*Elevation:* 5,200 to 5,990 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Coarse loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 7.4 inches

*Typical profile:*

A1—0 to 6 inches; sandy loam

A2—6 to 14 inches; loam

A3—14 to 22 inches; gravelly sandy loam

Bw—22 to 34 inches; gravelly sandy loam

C—34 to 60 inches; gravelly sandy loam

### **Additional Components**

Nissler and similar soils: 10 percent

Larkspur, stony and similar soils: 5 percent

Rock outcrop: 5 percent

## **532E—Hungryhill-Poin-Larkspur complex, 15 to 45 percent slopes, stony**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,250 to 6,770 feet

*Mean annual precipitation:* 14 to 18 inches

*Frost-free period:* 50 to 70 days

## Component Description

### **Hungryhill, stony and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Backslope on south-tending hill

*Slope:* 15 to 30 percent, east to northwest aspects

*Elevation:* 5,250 to 6,770 feet

*Effective annual precipitation:* 12 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent boulders, 40 to 100 feet apart

*Depth to restrictive feature:* Lithic bedrock: 20 to 40 inches

*Drainage class:* Well drained

*Parent material:* Loamy skeletal colluvium over volcanic and sedimentary rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.2 inches

*Typical profile:*

A1—0 to 4 inches; gravelly loam

A2—4 to 11 inches; gravelly loam

Bt—11 to 20 inches; very gravelly sandy clay loam

BC—20 to 31 inches; very gravelly sandy loam

R—31 to 60 inches; bedrock

### **Poin, stony and similar soils**

*Composition:* 25 percent

*Geomorphic description:* Backslope on south-tending hill

*Slope:* 15 to 45 percent, east to northwest aspects

*Elevation:* 5,250 to 6,770 feet

*Effective annual precipitation:* 12 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very gravelly sandy loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent boulders, 40 to 100 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Well drained

*Parent material:* Colluvium and/or residuum over volcanic rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.1 inches

*Typical profile:*

A—0 to 5 inches; very gravelly sandy loam

Bw—5 to 13 inches; very cobbly sandy loam

C—13 to 15 inches; very cobbly coarse sandy loam

R—15 to 60 inches; bedrock

### **Larkspur, stony and similar soils**

*Composition:* 20 percent

*Geomorphic description:*

- Shoulder on south-tending hill
- Summit on south-tending hill
- South-tending ridge

*Slope:* 15 to 30 percent, east to northwest aspects

*Elevation:* 5,250 to 6,770 feet

*Effective annual precipitation:* 12 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Extremely gravelly coarse sandy loam  
*Rock fragments on the soil surface:* 0.01 to 0.10 percent boulders, 40 to 100 feet apart  
*Depth to restrictive feature:* Lithic bedrock: 3 to 10 inches  
*Drainage class:* Well drained  
*Parent material:* Colluvium and/or residuum over volcanic and sedimentary rock  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 0.6 inches  
*Typical profile:*  
A—0 to 4 inches; extremely gravelly coarse sandy loam  
C—4 to 9 inches; very cobbly coarse sandy loam  
R—9 to 60 inches; bedrock

#### **Additional Components**

Bridger and similar soils: 12 percent  
Rock outcrop: 8 percent

### **534D—Chinasprings-Travona complex, 4 to 15 percent slopes, moderately impacted**

#### **Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,120 to 6,000 feet  
*Mean annual precipitation:* 12 to 14 inches  
*Frost-free period:* 70 to 90 days

#### **Component Description**

##### **Chinasprings, moderately impacted and similar soils**

*Composition:* 65 percent  
*Geomorphic description:*

- Alluvial fan
- Backslope on low hill

*Slope:* 4 to 15 percent  
*Elevation:* 5,120 to 6,000 feet  
*Effective annual precipitation:* 12 to 14 inches  
*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Ashy sandy loam  
*Depth to restrictive feature:* Paralithic bedrock: 40 to 60 inches  
*Drainage class:* Well drained  
*Parent material:* Volcanic ash-influenced alluvium over volcanic and sedimentary rock  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 5.9 inches  
*Typical profile:*  
A1—0 to 0 inches; ashy sandy loam  
A2—0 to 6 inches; ashy sandy loam  
Bt—6 to 20 inches; gravelly ashy sandy clay loam  
Bk—20 to 44 inches; gravelly ashy sandy loam  
BCk—44 to 58 inches; gravelly ashy sandy loam  
Cr—58 to 79 inches; ashy bedrock

**Travona, moderately impacted and similar soils**

*Composition:* 25 percent

*Geomorphic description:*

- Alluvial fan
- Footslope on low hill
- Swale

*Slope:* 4 to 12 percent

*Elevation:* 5,120 to 6,000 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Ashy sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Volcanic ash-influenced alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 6.7 inches

*Typical profile:*

A1—0 to 0 inches; ashy sandy loam

A2—0 to 9 inches; ashy sandy loam

Bw—9 to 23 inches; ashy sandy loam

Bk—23 to 41 inches; ashy sandy loam

Bck—41 to 60 inches; ashy sandy loam

**Additional Components**

Gnojek, moderately impacted and similar soils: 5 percent

Reedpoint, moderately impacted and similar soils: 4 percent

Rock outcrop: 1 percent

**536F—Hungryhill, very stony-Euell, very stony-Poin  
extremely stony complex, 25 to 60 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,220 to 6,940 feet

*Mean annual precipitation:* 14 to 17 inches

*Frost-free period:* 50 to 70 days

**Component Description**

**Hungryhill, very stony and similar soils**

*Composition:* 55 percent

*Geomorphic description:* Backslope on south-tending mountain slope

*Slope:* 30 to 60 percent, east to northwest aspects

*Elevation:* 5,220 to 6,940 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Channery loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* Lithic bedrock: 20 to 40 inches

*Drainage class:* Well drained

*Parent material:* Loamy skeletal colluvium over volcanic and sedimentary rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.2 inches

*Typical profile:*

A1—0 to 4 inches; channery loam

A2—4 to 11 inches; gravelly loam

Bt—11 to 20 inches; very gravelly sandy clay loam

BC—20 to 31 inches; very gravelly sandy loam

R—31 to 60 inches; bedrock

**Euell, very stony and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Backslope on south-tending mountain slope

*Slope:* 30 to 60 percent, east to northwest aspects

*Elevation:* 5,220 to 6,940 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly ashy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* Lithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Loamy skeletal colluvium over volcanic rock

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 5.1 inches

*Typical profile:*

A—0 to 10 inches; gravelly ashy loam

Bt—10 to 26 inches; very gravelly ashy sandy clay loam

BC—26 to 58 inches; very gravelly ashy sandy loam

R—58 to 60 inches; bedrock

**Poin, extremely stony and similar soils**

*Composition:* 15 percent

*Geomorphic description:*

- Summit on south-tending mountain slope
- Shoulder on south-tending mountain slope

*Slope:* 25 to 50 percent, east to northwest aspects

*Elevation:* 5,220 to 6,940 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very cobbly sandy loam

*Rock fragments on the soil surface:* 2 to 10 percent stones, 3 to 13 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Well drained

*Parent material:* Colluvium and/or residuum over volcanic rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.1 inches

*Typical profile:*

A—0 to 5 inches; very cobbly sandy loam

Bw—5 to 13 inches; very cobbly sandy loam

C—13 to 15 inches; very cobbly coarse sandy loam

R—15 to 60 inches; bedrock

### **Additional Components**

Rock outcrop: 10 percent

Larkspur, extremely stony and similar soils: 5 percent

## **537E—Bigbutte-Hungryhill-Poin complex, 8 to 30 percent slopes, very stony**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,510 to 6,870 feet

*Mean annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Bigbutte, very stony and similar soils**

*Composition:* 50 percent

*Geomorphic description:* Backslope on north-tending hill

*Slope:* 15 to 30 percent, west to east aspects

*Elevation:* 5,510 to 6,870 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Ashy sandy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 33 feet apart

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 28 to 60 inches

*Drainage class:* Well drained

*Parent material:* Volcanic ash-influenced colluvium over volcanic and sedimentary rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.3 inches

*Typical profile:*

A—0 to 8 inches; ashy sandy loam

Bw—8 to 17 inches; gravelly ashy sandy loam

BC—17 to 30 inches; gravelly ashy sandy loam

Cr—30 to 36 inches; bedrock

R—36 to 60 inches; bedrock

#### **Hungryhill, very stony and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Backslope on north-tending hill

*Slope:* 8 to 20 percent, west to east aspects

*Elevation:* 5,510 to 6,870 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 33 feet apart

*Depth to restrictive feature:* Lithic bedrock: 20 to 40 inches

*Drainage class:* Well drained

*Parent material:* Loamy skeletal colluvium over volcanic and sedimentary rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.2 inches

*Typical profile:*

- A1—0 to 4 inches; gravelly loam
- A2—4 to 11 inches; gravelly loam
- Bt—11 to 20 inches; very gravelly sandy clay loam
- BC—20 to 31 inches; very gravelly sandy loam
- R—31 to 60 inches; bedrock

**Poin, very stony and similar soils**

*Composition:* 20 percent

*Geomorphic description:*

- Summit on north-tending hill
- Shoulder on north-tending hill

*Slope:* 8 to 30 percent, west to east aspects

*Elevation:* 5,510 to 6,870 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very gravelly sandy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 33 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Well drained

*Parent material:* Colluvium and/or residuum over volcanic rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.1 inches

*Typical profile:*

- A—0 to 5 inches; very gravelly sandy loam
- Bw—5 to 13 inches; very cobbly sandy loam
- C—13 to 15 inches; very cobbly coarse sandy loam
- R—15 to 60 inches; bedrock

**Additional Components**

Bridger and similar soils: 5 percent

Browngulch and similar soils: 5 percent

**540D—Evaro-Germangulch complex, 4 to 25 percent slopes, extremely stony**

**Map Unit Setting**

*Interpretive focus:* Forestland

*Elevation:* 5,840 to 7,270 feet

*Mean annual precipitation:* 17 to 19 inches

*Frost-free period:* 30 to 50 days

**Component Description**

**Evaro, extremely stony and similar soils**

*Composition:* 45 percent

*Geomorphic description:* Mountain ridge

*Slope:* 4 to 25 percent

*Elevation:* 5,840 to 7,270 feet

*Effective annual precipitation:* 17 to 19 inches

*Frost-free period:* 30 to 50 days



*Surface layer texture:* Gravelly ashy sandy loam  
*Rock fragments on the soil surface:* 3 to 15 percent stones, 3 to 10 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Somewhat excessively drained  
*Parent material:* Colluvium over volcanic rock  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 4.3 inches  
*Typical profile:*  
    Oi—0 to 1 inches; slightly decomposed plant material  
    Oe—1 to 3 inches; moderately decomposed plant material  
    A—3 to 8 inches; gravelly ashy sandy loam  
    E—8 to 21 inches; very gravelly sandy loam  
    E and Bt—21 to 60 inches; very gravelly sandy clay loam

**Germangulch, extremely stony and similar soils**

*Composition:* 35 percent  
*Geomorphic description:* Mountain ridge  
*Slope:* 4 to 25 percent  
*Elevation:* 5,840 to 7,270 feet  
*Effective annual precipitation:* 17 to 19 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Gravelly ashy sandy loam  
*Rock fragments on the soil surface:* 3 to 15 percent stones, 3 to 10 feet apart  
*Depth to restrictive feature:* Paralithic bedrock: 20 to 40 inches  
*Drainage class:* Well drained  
*Parent material:* Loamy colluvium over volcanic rock  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 4.0 inches  
*Typical profile:*  
    Oi—0 to 2 inches; slightly decomposed plant material  
    E—2 to 10 inches; gravelly ashy sandy loam  
    Bt—10 to 24 inches; cobbly loam  
    BC—24 to 31 inches; very gravelly sandy loam  
    Cr—31 to 60 inches; bedrock

**Additional Components**

Coslaw, extremely stony and similar soils: 10 percent  
Evaro, stony and similar soils: 10 percent

**541F—Hungryhill-Euell complex, 20 to 50 percent slopes,  
very stony**

**Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,630 to 7,460 feet  
*Mean annual precipitation:* 15 to 17 inches  
*Frost-free period:* 50 to 70 days

## Component Description

### **Hungryhill, very stony and similar soils**

*Composition:* 55 percent

*Geomorphic description:* Backslope on south-tending mountain slope

*Slope:* 20 to 50 percent, east to northwest aspects

*Elevation:* 5,630 to 7,460 feet

*Effective annual precipitation:* 13 to 15 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 10 to 40 feet apart

*Depth to restrictive feature:* Lithic bedrock: 20 to 40 inches

*Drainage class:* Well drained

*Parent material:* Loamy skeletal colluvium over volcanic and sedimentary rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.2 inches

*Typical profile:*

A1—0 to 4 inches; gravelly loam

A2—4 to 11 inches; gravelly loam

Bt—11 to 20 inches; very gravelly sandy clay loam

BC—20 to 31 inches; very gravelly sandy loam

R—31 to 60 inches; bedrock

### **Euell, very stony and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Backslope on south-tending mountain slope

*Slope:* 20 to 50 percent, east to northwest aspects

*Elevation:* 5,630 to 7,460 feet

*Effective annual precipitation:* 13 to 15 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly ashy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 10 to 40 feet apart

*Depth to restrictive feature:* Lithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Loamy skeletal colluvium over volcanic rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.1 inches

*Typical profile:*

A—0 to 10 inches; gravelly ashy loam

Bt—10 to 26 inches; very gravelly ashy sandy clay loam

BC—26 to 58 inches; very gravelly ashy sandy loam

R—58 to 60 inches; bedrock

## Additional Components

Poin, very stony and similar soils: 10 percent

## **542D—Euell-Hungryhill-Bullrey complex, 4 to 15 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 6,170 to 7,250 feet

*Mean annual precipitation:* 17 to 19 inches

*Frost-free period:* 30 to 50 days

### **Component Description**

#### **Euell and similar soils**

*Composition:* 40 percent

*Geomorphic description:* Broad mountaintop ridge

*Slope:* 4 to 12 percent

*Elevation:* 6,170 to 7,250 feet

*Effective annual precipitation:* 17 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Ashy loam

*Depth to restrictive feature:* Lithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Loamy skeletal colluvium over volcanic rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.1 inches

*Typical profile:*

A—0 to 10 inches; ashy loam

Bt—10 to 26 inches; very gravelly ashy sandy clay loam

BC—26 to 58 inches; very gravelly ashy sandy loam

R—58 to 60 inches; bedrock

#### **Hungryhill and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Broad mountaintop ridge

*Slope:* 8 to 15 percent

*Elevation:* 6,170 to 7,250 feet

*Effective annual precipitation:* 17 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Gravelly loam

*Depth to restrictive feature:* Lithic bedrock: 20 to 40 inches

*Drainage class:* Well drained

*Parent material:* Loamy skeletal colluvium over volcanic and sedimentary rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.2 inches

*Typical profile:*

A1—0 to 4 inches; gravelly loam

A2—4 to 11 inches; gravelly loam

Bt—11 to 20 inches; very gravelly sandy clay loam

BC—20 to 31 inches; very gravelly sandy loam

R—31 to 60 inches; bedrock

**Bullrey and similar soils**

*Composition:* 25 percent

*Geomorphic description:*

- Broad mountaintop ridge
- Saddle

*Slope:* 4 to 8 percent

*Elevation:* 6,170 to 7,250 feet

*Effective annual precipitation:* 17 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Gravelly loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium and/or colluvium derived from rhyolite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.4 inches

*Typical profile:*

A1—0 to 7 inches; gravelly loam

A2—7 to 15 inches; very gravelly loam

Bw—15 to 24 inches; very gravelly loam

C—24 to 60 inches; very gravelly sandy loam

**Additional Components**

Larkspur and similar soils: 5 percent

**543F—Evaro-Vitroff-Germangulch, very stony complex,  
20 to 50 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Forestland

*Elevation:* 5,510 to 6,870 feet

*Mean annual precipitation:* 17 to 19 inches

*Frost-free period:* 30 to 50 days

**Component Description**

**Evaro and similar soils**

*Composition:* 45 percent

*Geomorphic description:* Backslope on north-tending mountain slope

*Slope:* 20 to 50 percent, west to east aspects

*Elevation:* 5,510 to 6,870 feet

*Effective annual precipitation:* 19 to 23 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Gravelly ashy sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Somewhat excessively drained

*Parent material:* Colluvium over volcanic rock

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 4.3 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

Oe—1 to 3 inches; moderately decomposed plant material

Silver Bow County Area and Parts of Beaverhead and Jefferson Counties, Montana

- A—3 to 8 inches; gravelly ashy sandy loam
- E—8 to 21 inches; very gravelly sandy loam
- E and Bt—21 to 60 inches; very gravelly sandy clay loam

**Vitroff and similar soils**

*Composition:* 20 percent

*Geomorphic description:*

- Foothlope on north-tending mountain slope
- Backslope on north-tending mountain slope

*Slope:* 20 to 35 percent, west to east aspects

*Elevation:* 5,510 to 6,870 feet

*Effective annual precipitation:* 19 to 23 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Gravelly ashy sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Tuffaceous colluvium and/or slope alluvium derived from volcanic rock

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 6.1 inches

*Typical profile:*

- Oi—0 to 2 inches; slightly decomposed plant material
- E1—2 to 7 inches; gravelly ashy sandy loam
- E2—7 to 13 inches; gravelly ashy sandy loam
- Bt and E—13 to 21 inches; gravelly ashy sandy clay loam
- Bt—21 to 33 inches; gravelly ashy sandy clay loam
- BC—33 to 60 inches; very gravelly ashy sandy loam

**Germangulch, very stony and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Backslope on north-tending mountain slope

*Slope:* 20 to 50 percent, west to east aspects

*Elevation:* 5,510 to 6,870 feet

*Effective annual precipitation:* 19 to 23 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Gravelly ashy sandy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 10 to 40 feet apart

*Depth to restrictive feature:* Paralithic bedrock: 20 to 40 inches

*Drainage class:* Well drained

*Parent material:* Loamy colluvium over volcanic rock

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 4.0 inches

*Typical profile:*

- Oi—0 to 2 inches; slightly decomposed plant material
- E—2 to 10 inches; gravelly ashy sandy loam
- Bt—10 to 24 inches; cobbly loam
- BC—24 to 31 inches; very gravelly sandy loam
- Cr—31 to 60 inches; bedrock

**Additional Components**

Coslaw, extremely stony and similar soils: 10 percent

Rock outcrop: 10 percent

## **545G—Illiano, very stony-Rock outcrop-Rubble land complex, 45 to 75 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Forestland  
*Elevation:* 5,220 to 7,430 feet  
*Mean annual precipitation:* 14 to 18 inches  
*Frost-free period:* 30 to 50 days

### **Component Description**

#### **Illiano, very stony and similar soils**

*Composition:* 40 percent  
*Geomorphic description:* Backslope on mountain  
*Slope:* 45 to 75 percent  
*Elevation:* 5,220 to 7,430 feet  
*Effective annual precipitation:* 15 to 17 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Very channery sandy loam  
*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 10 to 40 feet apart  
*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches  
*Drainage class:* Well drained  
*Parent material:* Residuum over rhyolite and/or welded tuff  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 0.9 inches  
*Typical profile:*  
    Oi—0 to 1 inches; slightly decomposed plant material  
    A—1 to 6 inches; very channery sandy loam  
    Bw—6 to 17 inches; very cobbly sandy loam  
    R—17 to 60 inches; bedrock

#### **Rock outcrop**

*Composition:* 30 percent

#### **Rubble land**

*Composition:* 15 percent

### **Additional Components**

Eastridge, very stony and similar soils: 10 percent  
Judco, stony and similar soils: 5 percent

## **546E—Hungryhill-Euell-Bullrey complex, 8 to 45 percent slopes, stony**

### **Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,350 to 6,040 feet  
*Mean annual precipitation:* 13 to 15 inches  
*Frost-free period:* 50 to 70 days

## Component Description

### **Hungryhill, stony and similar soils**

*Composition:* 40 percent

*Geomorphic description:* Backslope on south-tending hill

*Slope:* 15 to 45 percent, east to northwest aspects

*Elevation:* 5,350 to 6,040 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* Lithic bedrock: 20 to 40 inches

*Drainage class:* Well drained

*Parent material:* Loamy skeletal colluvium over volcanic and sedimentary rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.2 inches

*Typical profile:*

A1—0 to 4 inches; gravelly loam

A2—4 to 11 inches; gravelly loam

Bt—11 to 20 inches; very gravelly sandy clay loam

BC—20 to 31 inches; very gravelly sandy loam

R—31 to 60 inches; bedrock

### **Euell, stony and similar soils**

*Composition:* 25 percent

*Geomorphic description:* Backslope on north-tending hill

*Slope:* 15 to 45 percent, northwest to east aspects

*Elevation:* 5,350 to 6,040 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly ashy loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 30 to 100 feet apart

*Depth to restrictive feature:* Lithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Loamy skeletal colluvium over volcanic rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.1 inches

*Typical profile:*

A—0 to 10 inches; gravelly ashy loam

Bt—10 to 26 inches; very gravelly ashy sandy clay loam

BC—26 to 58 inches; very gravelly ashy sandy loam

R—58 to 60 inches; bedrock

### **Bullrey, stony and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Backslope on north-tending mountain

*Slope:* 8 to 25 percent, northwest to east aspects

*Elevation:* 5,350 to 6,040 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 30 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium and/or colluvium derived from rhyolite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.4 inches

*Typical profile:*

A1—0 to 7 inches; gravelly loam

A2—7 to 15 inches; very gravelly loam

Bw—15 to 24 inches; very gravelly loam

C—24 to 60 inches; very gravelly sandy loam

### **Additional Components**

Pappascreek and similar soils: 10 percent

Larkspur, stony and similar soils: 5 percent

Rock outcrop: 5 percent

## **548F—Evaro-Eastridge-Vitroff complex, 20 to 50 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Forestland

*Elevation:* 5,270 to 7,270 feet

*Mean annual precipitation:* 15 to 19 inches

*Frost-free period:* 30 to 50 days

### **Component Description**

#### **Evaro and similar soils**

*Composition:* 55 percent

*Geomorphic description:* Backslope on north-tending mountain slope

*Slope:* 25 to 50 percent, west to east aspects

*Elevation:* 5,270 to 7,270 feet

*Effective annual precipitation:* 17 to 21 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Gravelly ashy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Somewhat excessively drained

*Parent material:* Colluvium over volcanic rock

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 4.3 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

Oe—1 to 3 inches; moderately decomposed plant material

A—3 to 8 inches; gravelly ashy loam

E—8 to 21 inches; very gravelly sandy loam

E and Bt—21 to 60 inches; very gravelly sandy clay loam

#### **Eastridge and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Backslope on north-tending mountain slope

*Slope:* 20 to 45 percent, west to east aspects

*Elevation:* 5,270 to 7,270 feet



*Effective annual precipitation:* 17 to 21 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Gravelly ashy loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Volcanic ash-influenced alluvium and/or colluvium  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 4.6 inches  
*Typical profile:*  
    Oi—0 to 2 inches; slightly decomposed plant material  
    E1—2 to 7 inches; gravelly ashy loam  
    E2—7 to 11 inches; very gravelly ashy sandy loam  
    E/Bt—11 to 15 inches; very cobbly ashy sandy clay loam  
    Bt—15 to 31 inches; very gravelly ashy sandy clay loam  
    BC—31 to 60 inches; very gravelly ashy sandy loam

**Vitroff and similar soils**

*Composition:* 15 percent  
*Geomorphic description:* Footslope on north-tending mountain slope  
*Slope:* 20 to 35 percent, west to east aspects  
*Elevation:* 5,270 to 7,270 feet  
*Effective annual precipitation:* 17 to 20 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Ashy loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Tuffaceous colluvium and/or slope alluvium derived from volcanic rock  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 6.1 inches  
*Typical profile:*  
    Oi—0 to 2 inches; slightly decomposed plant material  
    E1—2 to 7 inches; ashy loam  
    E2—7 to 13 inches; gravelly ashy sandy loam  
    Bt and E—13 to 21 inches; gravelly ashy sandy clay loam  
    Bt—21 to 33 inches; gravelly ashy sandy clay loam  
    BC—33 to 60 inches; very gravelly ashy sandy loam

**Additional Components**

Coslaw and similar soils: 9 percent  
Rock outcrop: 1 percent

**550E—Evaro-Vitroff complex, 8 to 30 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Forestland  
*Elevation:* 5,760 to 7,170 feet  
*Mean annual precipitation:* 18 to 22 inches  
*Frost-free period:* 30 to 50 days

## Component Description

### Evapo and similar soils

*Composition:* 60 percent

*Geomorphic description:*

- Foothills on north-trending mountain slope
- Toeslope on north-trending mountain slope

*Slope:* 8 to 30 percent, west to southeast aspects

*Elevation:* 5,760 to 7,170 feet

*Effective annual precipitation:* 19 to 23 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Gravelly ashy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Somewhat excessively drained

*Parent material:* Colluvium over volcanic rock

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 4.3 inches

*Typical profile:*

- O<sub>i</sub>—0 to 1 inches; slightly decomposed plant material
- O<sub>e</sub>—1 to 3 inches; moderately decomposed plant material
- A—3 to 8 inches; gravelly ashy loam
- E—8 to 21 inches; very gravelly sandy loam
- E and B<sub>t</sub>—21 to 60 inches; very gravelly sandy clay loam

### Vitroff and similar soils

*Composition:* 20 percent

*Geomorphic description:*

- Toeslope on north-trending mountain slope
- Foothills on north-trending mountain slope

*Slope:* 8 to 30 percent, west to southeast aspects

*Elevation:* 5,760 to 7,170 feet

*Effective annual precipitation:* 19 to 23 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Ashy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Tuffaceous colluvium and/or slope alluvium derived from volcanic rock

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 6.1 inches

*Typical profile:*

- O<sub>i</sub>—0 to 2 inches; slightly decomposed plant material
- E<sub>1</sub>—2 to 7 inches; ashy loam
- E<sub>2</sub>—7 to 13 inches; gravelly ashy sandy loam
- B<sub>t</sub> and E—13 to 21 inches; gravelly ashy sandy clay loam
- B<sub>t</sub>—21 to 33 inches; gravelly ashy sandy clay loam
- BC—33 to 60 inches; very gravelly ashy sandy loam

## Additional Components

Euell and similar soils: 8 percent

Judco, stony and similar soils: 7 percent

Savenac and similar soils: 5 percent

## **551D—Browns gulch gravelly sandy loam, 4 to 15 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,170 to 6,140 feet

*Mean annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Browns gulch and similar soils**

*Composition:* 85 percent

*Geomorphic description:*

- Alluvial fan
- Foothlope on mountain
- Toeslope on mountain

*Slope:* 4 to 15 percent

*Elevation:* 5,170 to 6,140 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Coarse loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 7.4 inches

*Typical profile:*

A1—0 to 6 inches; gravelly sandy loam

A2—6 to 14 inches; loam

A3—14 to 22 inches; gravelly sandy loam

Bw—22 to 34 inches; gravelly sandy loam

C—34 to 60 inches; gravelly sandy loam

### **Additional Components**

Branham and similar soils: 10 percent

Tuggle and similar soils: 5 percent

## **552E—Nissler-Browns gulch complex, 8 to 25 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,510 to 6,480 feet

*Mean annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Nissler and similar soils**

*Composition:* 60 percent

*Geomorphic description:* Backslope on hill

*Slope:* 8 to 25 percent  
*Elevation:* 5,510 to 6,480 feet  
*Effective annual precipitation:* 15 to 17 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Ashy loam  
*Depth to restrictive feature:* Lithic bedrock: 60 to 79 inches  
*Drainage class:* Well drained  
*Parent material:* Loamy alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 5.9 inches  
*Typical profile:*  
    A—0 to 8 inches; ashy loam  
    Bt—8 to 22 inches; ashy sandy clay loam  
    BC—22 to 60 inches; gravelly ashy sandy loam  
    R—60 to 70 inches; bedrock

**Browns gulch and similar soils**

*Composition:* 30 percent  
*Geomorphic description:*

- Footslope on hill
- Swale

*Slope:* 8 to 15 percent  
*Elevation:* 5,510 to 6,480 feet  
*Effective annual precipitation:* 15 to 17 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Coarse loamy alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 7.4 inches  
*Typical profile:*  
    A1—0 to 6 inches; loam  
    A2—6 to 14 inches; loam  
    A3—14 to 22 inches; gravelly sandy loam  
    Bw—22 to 34 inches; gravelly sandy loam  
    C—34 to 60 inches; gravelly sandy loam

**Additional Components**

Hungryhill, very stony and similar soils: 7 percent  
Foolhen and similar soils: 2 percent  
Rock outcrop: 1 percent

**554E—Bridger-Poin, very stony complex, 8 to 30 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,270 to 6,540 feet  
*Mean annual precipitation:* 14 to 17 inches  
*Frost-free period:* 50 to 70 days

## Component Description

### **Bridger and similar soils**

*Composition:* 50 percent

*Geomorphic description:* Backslope on south-tending mountain slope

*Slope:* 8 to 30 percent, east to northwest aspects

*Elevation:* 5,270 to 6,550 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Clayey alluvium over volcanic and sedimentary rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 7.9 inches

*Typical profile:*

A1—0 to 3 inches; loam

A2—3 to 9 inches; loam

Bt—9 to 17 inches; clay

Bk—17 to 34 inches; loam

C—34 to 60 inches; sandy loam

### **Poin, very stony and similar soils**

*Composition:* 25 percent

*Geomorphic description:*

- Backslope on south-tending mountain slope
- South-tending ridge

*Slope:* 8 to 25 percent, east to northwest aspects

*Elevation:* 5,270 to 6,550 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very cobbly sandy loam

*Rock fragments on the soil surface:* 0.10 to 5.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Well drained

*Parent material:* Colluvium and/or residuum over volcanic rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.1 inches

*Typical profile:*

A—0 to 5 inches; very cobbly sandy loam

Bw—5 to 13 inches; very cobbly sandy loam

C—13 to 15 inches; very cobbly coarse sandy loam

R—15 to 60 inches; bedrock

## Additional Components

Browns gulch and similar soils: 13 percent

Rock outcrop: 12 percent

## **557D—Savenac-Pappascreek-Mooseflat complex, 4 to 25 percent slopes, very stony**

### **Map Unit Setting**

*Interpretive focus:* Forestland and rangeland

*Elevation:* 5,710 to 7,170 feet

*Mean annual precipitation:* 15 to 19 inches

*Frost-free period:* 30 to 50 days

### **Component Description**

#### **Savenac, very stony and similar soils**

*Composition:* 45 percent

*Geomorphic description:* Footslope on mountain

*Slope:* 8 to 25 percent

*Elevation:* 5,710 to 7,170 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Gravelly ashy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Moderately well drained

*Parent material:* Volcanic ash and/or loess over clayey colluvium derived from volcanic rock

*Native plant cover type:* Forestland

*Flooding:* None

*Water table:* Present

*Available water capacity:* Mainly 8.0 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

E—2 to 12 inches; gravelly ashy loam

E/Bt—12 to 28 inches; sandy clay loam

Bt—28 to 37 inches; clay loam

BC—37 to 60 inches; gravelly sandy loam

#### **Pappascreek, very stony and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Toeslope on mountain

*Slope:* 6 to 20 percent

*Elevation:* 5,710 to 7,170 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Mucky peat

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Somewhat poorly drained

*Parent material:* Mixed alluvium over alluvium derived from volcanic rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Water table:* Present

*Available water capacity:* Mainly 7.1 inches

*Typical profile:*

Oe—0 to 3 inches; mucky peat

A—3 to 25 inches; loam

C—25 to 54 inches; stratified silt loam to loam to coarse sandy loam

2C—54 to 72 inches; gravelly coarse sand

**Mooseflat, very stony and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Mountain drainageway

*Slope:* 4 to 12 percent

*Elevation:* 5,710 to 7,170 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Mucky peat

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Very poorly drained

*Parent material:* Mixed alluvium over alluvium derived from volcanic rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Water table:* Present

*Available water capacity:* Mainly 5.1 inches

*Typical profile:*

Oe—0 to 5 inches; mucky peat

A—5 to 14 inches; loam

Bg—14 to 28 inches; sandy clay loam

2Cg—28 to 72 inches; very gravelly coarse sand

**559E—Eastridge-Euell, cool complex, 8 to 30 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Forestland

*Elevation:* 5,200 to 6,840 feet

*Mean annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

**Component Description**

**Eastridge and similar soils**

*Composition:* 70 percent

*Geomorphic description:* Footslope on mountain

*Slope:* 8 to 25 percent

*Elevation:* 5,200 to 6,840 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly ashy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Volcanic ash-influenced alluvium and/or colluvium

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 4.6 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

E1—2 to 7 inches; gravelly ashy loam

E2—7 to 11 inches; very gravelly ashy sandy loam  
E/Bt—11 to 15 inches; very cobbly ashy sandy clay loam  
Bt—15 to 31 inches; very gravelly ashy sandy clay loam  
BC—31 to 60 inches; very gravelly ashy sandy loam

**Euell, cool and similar soils**

*Composition:* 20 percent  
*Geomorphic description:* Foothills on mountain  
*Slope:* 15 to 30 percent  
*Elevation:* 5,200 to 6,840 feet  
*Effective annual precipitation:* 15 to 19 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Gravelly ashy sandy loam  
*Depth to restrictive feature:* Lithic bedrock: 40 to 60 inches  
*Drainage class:* Well drained  
*Parent material:* Loamy skeletal colluvium over volcanic rock  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 5.1 inches  
*Typical profile:*  
A—0 to 10 inches; gravelly ashy sandy loam  
Bt—10 to 26 inches; very gravelly ashy sandy clay loam  
BC—26 to 58 inches; very gravelly ashy sandy loam  
R—58 to 60 inches; bedrock

**Additional Components**

Savenac and similar soils: 10 percent

**561F—Euell-Bigbutte complex, 20 to 50 percent slopes,  
stony**

**Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,690 to 7,120 feet  
*Mean annual precipitation:* 16 to 19 inches  
*Frost-free period:* 50 to 70 days

**Component Description**

**Euell, stony and similar soils**

*Composition:* 55 percent  
*Geomorphic description:* Backslope on south-tending mountain slope  
*Slope:* 20 to 50 percent, east to northwest aspects  
*Elevation:* 5,690 to 7,120 feet  
*Effective annual precipitation:* 15 to 17 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Cobbly ashy sandy loam  
*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 33 to 100 feet apart  
*Depth to restrictive feature:* Lithic bedrock: 40 to 60 inches  
*Drainage class:* Well drained  
*Parent material:* Loamy skeletal colluvium over volcanic rock  
*Native plant cover type:* Rangeland  
*Flooding:* None



*Available water capacity:* Mainly 5.1 inches

*Typical profile:*

- A—0 to 10 inches; cobbly ashy sandy loam
- Bt—10 to 26 inches; very gravelly ashy sandy clay loam
- BC—26 to 58 inches; very gravelly ashy sandy loam
- R—58 to 60 inches; bedrock

**Bigbutte, stony and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Backslope on south-tending mountain slope

*Slope:* 20 to 50 percent, east to northwest aspects

*Elevation:* 5,690 to 7,120 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Ashy sandy loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 33 to 100 feet apart

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 28 to 60 inches

*Drainage class:* Well drained

*Parent material:* Volcanic ash-influenced colluvium over volcanic and sedimentary rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.3 inches

*Typical profile:*

- A—0 to 8 inches; ashy sandy loam
- Bw—8 to 17 inches; gravelly ashy sandy loam
- BC—17 to 30 inches; gravelly ashy sandy loam
- Cr—30 to 36 inches; bedrock
- R—36 to 60 inches; bedrock

**Additional Components**

Eastridge, stony and similar soils: 10 percent

Rock outcrop: 6 percent

Poin, very stony and similar soils: 5 percent

Larkspur, very stony and similar soils: 4 percent

**562G—Poin, very stony-Rubble land-Eastridge, very stony complex, 25 to 70 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland and forestland

*Elevation:* 5,120 to 6,690 feet

*Mean annual precipitation:* 16 to 19 inches

*Frost-free period:* 50 to 70 days

**Component Description**

**Poin, very stony and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Backslope on south-tending mountain slope

*Slope:* 35 to 70 percent, east to northwest aspects

*Elevation:* 5,120 to 6,690 feet

*Effective annual precipitation:* 14 to 17 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Very gravelly sandy loam  
*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart  
*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches  
*Drainage class:* Well drained  
*Parent material:* Colluvium and/or residuum over volcanic rock  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 1.1 inches  
*Typical profile:*  
    A—0 to 5 inches; very gravelly sandy loam  
    Bw—5 to 13 inches; very cobbly sandy loam  
    C—13 to 15 inches; very cobbly coarse sandy loam  
    R—15 to 60 inches; bedrock

**Rubble land**

*Composition:* 25 percent

**Eastridge, very stony and similar soils**

*Composition:* 20 percent  
*Geomorphic description:*

- Backslope on south-tending mountain slope
- South-tending swale

*Slope:* 25 to 50 percent, east to northwest aspects  
*Elevation:* 5,120 to 6,690 feet  
*Effective annual precipitation:* 14 to 17 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Very gravelly ashy sandy loam  
*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Volcanic ash-influenced alluvium and/or colluvium  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 4.6 inches  
*Typical profile:*  
    Oi—0 to 2 inches; slightly decomposed plant material  
    E1—2 to 7 inches; very gravelly ashy sandy loam  
    E2—7 to 11 inches; very gravelly ashy sandy loam  
    E/Bt—11 to 15 inches; very cobbly ashy sandy clay loam  
    Bt—15 to 31 inches; very gravelly ashy sandy clay loam  
    BC—31 to 60 inches; very gravelly ashy sandy loam

**Larkspur, very stony and similar soils**

*Composition:* 15 percent  
*Geomorphic description:*

- Shoulder on south-tending mountain slope
- Backslope on south-tending mountain slope

*Slope:* 35 to 70 percent, east to northwest aspects  
*Elevation:* 5,120 to 6,690 feet  
*Effective annual precipitation:* 14 to 17 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Very gravelly sandy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* Lithic bedrock: 3 to 10 inches

*Drainage class:* Well drained

*Parent material:* Colluvium and/or residuum over volcanic and sedimentary rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 0.6 inches

*Typical profile:*

A—0 to 4 inches; very gravelly sandy loam

C—4 to 9 inches; very cobbly coarse sandy loam

R—9 to 60 inches; bedrock

### **Additional Components**

Rock outcrop: 5 percent

## **564D—Chinasprings-Patouza-Nivean complex, 4 to 15 percent slopes, stony**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,450 to 5,940 feet

*Mean annual precipitation:* 12 to 15 inches

*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Chinasprings, moderately impacted, stony and similar soils**

*Composition:* 40 percent

*Geomorphic description:* Backslope on hill

*Slope:* 4 to 15 percent

*Elevation:* 5,450 to 5,940 feet

*Effective annual precipitation:* 12 to 15 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Ashy loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* Paralithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Volcanic ash-influenced alluvium over volcanic and sedimentary rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.9 inches

*Typical profile:*

A—0 to 6 inches; ashy loam

Bt—6 to 20 inches; gravelly ashy sandy clay loam

Bk—20 to 44 inches; gravelly ashy sandy loam

BCk—44 to 58 inches; ashy gravelly sandy loam

Cr—58 to 79 inches; ashy bedrock

#### **Patouza, moderately impacted, stony and similar soils**

*Composition:* 30 percent

*Geomorphic description:*

- Backslope on hill
- Footslope on hill

Silver Bow County Area and Parts of Beaverhead and Jefferson Counties, Montana

*Slope:* 4 to 12 percent

*Elevation:* 5,450 to 5,940 feet

*Effective annual precipitation:* 12 to 15 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* Paralithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Clayey alluvium over volcanic and sedimentary rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 8.5 inches

*Typical profile:*

A—0 to 7 inches; loam

Bt—7 to 19 inches; clay loam

Bk—19 to 41 inches; loam

BCk—41 to 57 inches; sandy clay loam

Cr—57 to 60 inches; bedrock

**Nivean, moderately impacted, stony and similar soils**

*Composition:* 15 percent

*Geomorphic description:*

- Backslope on hill
- Shoulder on hill

*Slope:* 8 to 15 percent

*Elevation:* 5,450 to 5,940 feet

*Effective annual precipitation:* 12 to 15 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Gravelly sandy loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:*

- Paralithic bedrock: 10 to 17 inches
- Lithic bedrock: 13 to 20 inches

*Drainage class:* Well drained

*Parent material:* Residuum over rhyolite and/or welded tuff

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 0.8 inches

*Typical profile:*

A—0 to 4 inches; gravelly sandy loam

Bw—4 to 10 inches; very gravelly sandy loam

BC—10 to 13 inches; extremely gravelly coarse sandy loam

Cr—13 to 17 inches; bedrock

R—17 to 60 inches; bedrock

**Additional Components**

Travona, moderately impacted, stony and similar soils: 9 percent

Rock outcrop: 4 percent

Mannixlee, moderately impacted and similar soils: 2 percent

## 567F—Evaro-Eastridge complex, 20 to 50 percent slopes

### Map Unit Setting

*Interpretive focus:* Forestland  
*Elevation:* 6,230 to 7,480 feet  
*Mean annual precipitation:* 17 to 21 inches  
*Frost-free period:* 30 to 50 days

### Component Description

#### **Evaro and similar soils**

*Composition:* 55 percent  
*Geomorphic description:* Backslope on north-tending mountain slope  
*Slope:* 25 to 50 percent, west to east aspects  
*Elevation:* 6,230 to 7,480 feet  
*Effective annual precipitation:* 19 to 24 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Gravelly ashy loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Somewhat excessively drained  
*Parent material:* Colluvium over volcanic rock  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 4.3 inches  
*Typical profile:*  
    Oi—0 to 1 inches; slightly decomposed plant material  
    Oe—1 to 3 inches; moderately decomposed plant material  
    A—3 to 8 inches; gravelly ashy loam  
    E—8 to 21 inches; very gravelly sandy loam  
    E and Bt—21 to 60 inches; very gravelly sandy clay loam

#### **Eastridge and similar soils**

*Composition:* 25 percent  
*Geomorphic description:*

- Backslope on north-tending mountain slope
- Footslope on north-tending mountain slope

*Slope:* 20 to 45 percent, west to east aspects  
*Elevation:* 6,230 to 7,480 feet  
*Effective annual precipitation:* 19 to 24 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Gravelly ashy loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Volcanic ash-influenced alluvium and/or colluvium  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 4.6 inches  
*Typical profile:*  
    Oi—0 to 2 inches; slightly decomposed plant material  
    E1—2 to 7 inches; gravelly ashy loam  
    E2—7 to 11 inches; very gravelly ashy sandy loam  
    E/Bt—11 to 15 inches; very cobbly ashy sandy clay loam  
    Bt—15 to 31 inches; very gravelly ashy sandy clay loam  
    BC—31 to 60 inches; very gravelly ashy sandy loam

### **Additional Components**

Judco and similar soils: 12 percent  
Savenac and similar soils: 6 percent  
Rock outcrop: 2 percent

## **568F—Evaro-Coslaw-Hungryhill complex, 15 to 50 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Forestland and rangeland  
*Elevation:* 6,020 to 7,380 feet  
*Mean annual precipitation:* 18 to 22 inches  
*Frost-free period:* 30 to 50 days

### **Component Description**

#### **Evaro and similar soils**

*Composition:* 45 percent  
*Geomorphic description:* Backslope on forested south-tending mountain slope  
*Slope:* 20 to 50 percent, east to northwest aspects  
*Elevation:* 6,020 to 7,380 feet  
*Effective annual precipitation:* 15 to 19 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Gravelly ashy loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Somewhat excessively drained  
*Parent material:* Colluvium over volcanic rock  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 4.3 inches  
*Typical profile:*  
    Oi—0 to 1 inches; slightly decomposed plant material  
    Oe—1 to 3 inches; moderately decomposed plant material  
    A—3 to 8 inches; gravelly ashy loam  
    E—8 to 21 inches; very gravelly sandy loam  
    E and Bt—21 to 60 inches; very gravelly sandy clay loam

#### **Coslaw and similar soils**

*Composition:* 30 percent  
*Geomorphic description:*

- Shoulder on forested south-tending mountain slope
- Backslope on forested south-tending mountain slope

*Slope:* 15 to 45 percent, east to northwest aspects  
*Elevation:* 6,020 to 7,380 feet  
*Effective annual precipitation:* 15 to 19 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Very cobbly ashy sandy loam  
*Depth to restrictive feature:*

- Paralithic bedrock: 10 to 20 inches
- Lithic bedrock: 20 to 30 inches

*Drainage class:* Well drained  
*Parent material:* Residuum over welded tuff  
*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 1.2 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

A—2 to 6 inches; very cobbly ashy sandy loam

Bw—6 to 18 inches; very cobbly ashy coarse sandy loam

Cr—18 to 25 inches; bedrock

R—25 to 60 inches; bedrock

### **Hungryhill and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Backslope on grassland south-tending mountain slope

*Slope:* 15 to 45 percent, east to northwest aspects

*Elevation:* 6,020 to 7,380 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Gravelly loam

*Depth to restrictive feature:* Lithic bedrock: 20 to 40 inches

*Drainage class:* Well drained

*Parent material:* Loamy skeletal colluvium over volcanic and sedimentary rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.2 inches

*Typical profile:*

A1—0 to 4 inches; gravelly loam

A2—4 to 11 inches; gravelly loam

Bt—11 to 20 inches; very gravelly sandy clay loam

BC—20 to 31 inches; very gravelly sandy loam

R—31 to 60 inches; bedrock

### **Additional Components**

Poin and similar soils: 7 percent

Rock outcrop: 3 percent

## **569E—Evaro-Savenac complex, 15 to 30 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Forestland

*Elevation:* 5,560 to 6,760 feet

*Mean annual precipitation:* 15 to 20 inches

*Frost-free period:* 30 to 50 days

### **Component Description**

#### **Evaro and similar soils**

*Composition:* 65 percent

*Geomorphic description:*

- Mountainbase on mountain
- Slump

*Slope:* 15 to 30 percent

*Elevation:* 5,560 to 6,760 feet

*Effective annual precipitation:* 17 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Gravelly ashy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Somewhat excessively drained

*Parent material:* Colluvium over volcanic rock

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 4.3 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

Oe—1 to 3 inches; moderately decomposed plant material

A—3 to 8 inches; gravelly ashy loam

E—8 to 21 inches; very gravelly sandy loam

E and Bt—21 to 60 inches; very gravelly sandy clay loam

### **Savenac and similar soils**

*Composition:* 20 percent

*Geomorphic description:*

- Mountainbase on mountain
- Slump

*Slope:* 15 to 25 percent

*Elevation:* 5,560 to 6,760 feet

*Effective annual precipitation:* 17 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Ashy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Moderately well drained

*Parent material:* Volcanic ash and/or loess over clayey colluvium derived from volcanic rock

*Native plant cover type:* Forestland

*Flooding:* None

*Water table:* Present

*Available water capacity:* Mainly 8.0 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

E—2 to 12 inches; ashy loam

E/Bt—12 to 28 inches; sandy clay loam

Bt—28 to 37 inches; clay loam

BC—37 to 60 inches; gravelly sandy loam

### **Additional Components**

Evapo, greater slopes and similar soils: 10 percent

Vitroff and similar soils: 5 percent

## **570E—Eastridge-Euell complex, 15 to 40 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Forestland and rangeland

*Elevation:* 5,180 to 7,100 feet

*Mean annual precipitation:* 16 to 19 inches

*Frost-free period:* 50 to 70 days



## Component Description

### **Eastridge and similar soils**

*Composition:* 40 percent

*Geomorphic description:* Backslope on south-tending mountain slope

*Slope:* 15 to 40 percent, east to northwest aspects

*Elevation:* 5,180 to 7,100 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly ashy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Volcanic ash-influenced alluvium and/or colluvium

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 4.6 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

E1—2 to 7 inches; gravelly ashy loam

E2—7 to 11 inches; very gravelly ashy sandy loam

E/Bt—11 to 15 inches; very cobbly ashy sandy clay loam

Bt—15 to 31 inches; very gravelly ashy sandy clay loam

BC—31 to 60 inches; very gravelly ashy sandy loam

### **Euell and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Backslope on south-tending mountain slope

*Slope:* 15 to 40 percent, east to northwest aspects

*Elevation:* 5,180 to 7,100 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly ashy sandy loam

*Depth to restrictive feature:* Lithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Loamy skeletal colluvium over volcanic rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.1 inches

*Typical profile:*

A—0 to 10 inches; gravelly ashy sandy loam

Bt—10 to 26 inches; very gravelly ashy sandy clay loam

BC—26 to 58 inches; very gravelly ashy sandy loam

R—58 to 60 inches; bedrock

## Additional Components

Bullrey and similar soils: 10 percent

Illiano, very stony and similar soils: 10 percent

Hungryhill, stony and similar soils: 7 percent

Rock outcrop: 3 percent

## **572D—Euell-Nissler-Poin complex, 4 to 20 percent slopes, stony**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,890 to 6,610 feet

*Mean annual precipitation:* 17 to 19 inches

*Frost-free period:* 30 to 50 days

### **Component Description**

#### **Euell, stony and similar soils**

*Composition:* 35 percent

*Geomorphic description:*

- Broad ridge
- Saddle

*Slope:* 4 to 20 percent

*Elevation:* 5,890 to 6,610 feet

*Effective annual precipitation:* 17 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Gravelly ashy sandy loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* Lithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Loamy skeletal colluvium over volcanic rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.1 inches

*Typical profile:*

A—0 to 10 inches; gravelly ashy sandy loam

Bt—10 to 26 inches; very gravelly ashy sandy clay loam

BC—26 to 58 inches; very gravelly ashy sandy loam

R—58 to 60 inches; bedrock

#### **Nissler, stony and similar soils**

*Composition:* 30 percent

*Geomorphic description:*

- Broad ridge
- Saddle

*Slope:* 4 to 12 percent

*Elevation:* 5,890 to 6,610 feet

*Effective annual precipitation:* 17 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Ashy sandy loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* Lithic bedrock: 60 to 79 inches

*Drainage class:* Well drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.9 inches

*Typical profile:*

A—0 to 8 inches; ashy sandy loam

Bt—8 to 22 inches; ashy sandy clay loam

BC—22 to 60 inches; gravelly ashy sandy loam

R—60 to 70 inches; bedrock

**Poin, stony and similar soils**

*Composition:* 25 percent

*Geomorphic description:*

- Broad ridge
- Saddle

*Slope:* 4 to 20 percent

*Elevation:* 5,890 to 6,610 feet

*Effective annual precipitation:* 17 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Very gravelly sandy loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Well drained

*Parent material:* Colluvium and/or residuum over volcanic rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.1 inches

*Typical profile:*

A—0 to 5 inches; very gravelly sandy loam

Bw—5 to 13 inches; very cobbly sandy loam

C—13 to 15 inches; very cobbly coarse sandy loam

R—15 to 60 inches; bedrock

**Additional Components**

Euell, very stony, greater slopes and similar soils: 10 percent

**573E—Whitlash, very stony-Rock outcrop-Hungryhill,  
very stony complex, 8 to 30 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,120 to 6,070 feet

*Mean annual precipitation:* 14 to 17 inches

*Frost-free period:* 70 to 90 days

**Component Description**

**Whitlash, very stony and similar soils**

*Composition:* 45 percent

*Geomorphic description:* Backslope on south-tending hill

*Slope:* 15 to 30 percent, east to northwest aspects

*Elevation:* 5,120 to 6,070 feet

*Effective annual precipitation:* 12 to 15 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Very gravelly sandy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Well drained

*Parent material:* Colluvium and/or residuum over volcanic and sedimentary rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.1 inches

*Typical profile:*

A—0 to 4 inches; very gravelly sandy loam

Bw—4 to 12 inches; very gravelly sandy loam

BC—12 to 15 inches; very gravelly sandy loam

R—15 to 19 inches; bedrock

### **Rock outcrop**

*Composition:* 30 percent

*Elevation:* 5,120 to 6,070 feet

### **Hungryhill, very stony and similar soils**

*Composition:* 15 percent

*Geomorphic description:*

- Footslope on south-tending hill
- Backslope on south-tending swale

*Slope:* 8 to 20 percent, east to northwest aspects

*Elevation:* 5,120 to 6,070 feet

*Effective annual precipitation:* 12 to 15 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Very gravelly loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* Lithic bedrock: 20 to 40 inches

*Drainage class:* Well drained

*Parent material:* Loamy skeletal colluvium over volcanic and sedimentary rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.2 inches

*Typical profile:*

A1—0 to 4 inches; very gravelly loam

A2—4 to 11 inches; gravelly loam

Bt—11 to 20 inches; very gravelly sandy clay loam

BC—20 to 31 inches; very gravelly sandy loam

R—31 to 60 inches; bedrock

### **Additional Components**

Reedpoint, very stony and similar soils: 10 percent

## **574F—Bullrey-Browns gulch complex, 20 to 50 percent slopes, very stony**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,300 to 6,740 feet

*Mean annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Bullrey, very stony and similar soils**

*Composition:* 65 percent

*Geomorphic description:* Backslope on north-tending mountain slope

*Slope:* 20 to 50 percent, west to east aspects

*Elevation:* 5,300 to 6,740 feet  
*Effective annual precipitation:* 17 to 19 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Gravelly loam  
*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 33 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Alluvium and/or colluvium derived from rhyolite  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 5.4 inches  
*Typical profile:*  
    A1—0 to 7 inches; gravelly loam  
    A2—7 to 15 inches; very gravelly loam  
    Bw—15 to 24 inches; very gravelly loam  
    C—24 to 60 inches; very gravelly sandy loam

**Browns gulch, very stony and similar soils**

*Composition:* 30 percent  
*Geomorphic description:*

- Backslope on north-tending mountain slope
- Foothlope on north-tending mountain slope

*Slope:* 20 to 45 percent, west to east aspects  
*Elevation:* 5,300 to 6,740 feet  
*Effective annual precipitation:* 17 to 19 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Loam  
*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Coarse loamy alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 7.4 inches  
*Typical profile:*  
    A1—0 to 6 inches; loam  
    A2—6 to 14 inches; loam  
    A3—14 to 22 inches; gravelly sandy loam  
    Bw—22 to 34 inches; gravelly sandy loam  
    C—34 to 60 inches; gravelly sandy loam

**Additional Components**

Poin, very stony and similar soils: 4 percent  
Rock outcrop: 1 percent

**578D—Whitlash, very stony-Rock outcrop-Reedpoint,  
very stony, complex, 4 to 15 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,180 to 5,920 feet  
*Mean annual precipitation:* 12 to 14 inches  
*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Whitlash, very stony and similar soils**

*Composition:* 55 percent

*Geomorphic description:* Backslope on south-tending hill

*Slope:* 4 to 15 percent, east to northwest aspects

*Elevation:* 5,180 to 5,920 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Very gravelly sandy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Well drained

*Parent material:* Colluvium and/or residuum over volcanic and sedimentary rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.1 inches

*Typical profile:*

A—0 to 4 inches; very gravelly sandy loam

Bw—4 to 12 inches; very gravelly sandy loam

BC—12 to 15 inches; very gravelly sandy loam

R—15 to 19 inches; bedrock

#### **Rock outcrop**

*Composition:* 20 percent

*Elevation:* 5,180 to 5,920 feet

#### **Reedpoint, very stony and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Backslope on south-tending hill

*Slope:* 4 to 15 percent, east to northwest aspects

*Elevation:* 5,180 to 5,920 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Very gravelly sandy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* Lithic bedrock: 3 to 10 inches

*Drainage class:* Well drained

*Parent material:* Colluvium and/or residuum over volcanic and sedimentary rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 0.3 inches

*Typical profile:*

A—0 to 4 inches; very gravelly sandy loam

BC—4 to 5 inches; very gravelly sandy loam

R—5 to 60 inches; bedrock

### **Additional Components**

Hungryhill, very stony and similar soils: 10 percent

## **579D—Chinasprings-Dutton complex, 4 to 15 percent slopes, moderately impacted**

### **Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,250 to 5,490 feet  
*Mean annual precipitation:* 12 to 14 inches  
*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Chinasprings, moderately impacted and similar soils**

*Composition:* 55 percent  
*Geomorphic description:* Backslope of hill  
*Slope:* 4 to 15 percent  
*Elevation:* 5,250 to 5,500 feet  
*Effective annual precipitation:* 12 to 14 inches  
*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Ashy sandy loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Volcanic ash-influenced alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 6.0 inches  
*Typical profile:*  
    A1—0 to 0 inches; ashy sandy loam  
    A2—0 to 6 inches; ashy sandy loam  
    Bt—6 to 16 inches; gravelly ashy sandy clay loam  
    Bk1—16 to 24 inches; gravelly ashy sandy loam  
    Bk2—24 to 40 inches; ashy gravelly sandy loam  
    BCk—40 to 80 inches; gravelly ashy sandy loam

#### **Dutton, moderately impacted and similar soils**

*Composition:* 35 percent  
*Geomorphic description:* Swale  
*Slope:* 4 to 12 percent  
*Elevation:* 5,250 to 5,500 feet  
*Effective annual precipitation:* 12 to 14 inches  
*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Loam  
*Depth to restrictive feature:* Paralithic bedrock: 20 to 40 inches  
*Drainage class:* Well drained  
*Parent material:* Clayey alluvium and/or residuum over interbedded sandstone and shale  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 5.8 inches  
*Typical profile:*  
    A1—0 to 0 inches; loam  
    A2—0 to 8 inches; loam  
    Bt—8 to 18 inches; clay loam  
    Bk—18 to 34 inches; clay loam  
    Cr—34 to 44 inches; bedrock

### **Additional Components**

Cometcrik, moderately impacted and similar soils: 5 percent  
Whitlash, moderately impacted and similar soils: 5 percent

## **580E—Patouza-Chinasprings-Nivean complex, 8 to 30 percent slopes, moderately impacted**

### **Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,580 to 5,900 feet  
*Mean annual precipitation:* 14 to 16 inches  
*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Patouza, moderately impacted and similar soils**

*Composition:* 40 percent  
*Geomorphic description:*

- Backslope on south-tending hill
- Footslope on south-tending hill

*Slope:* 8 to 20 percent, east to northwest aspects  
*Elevation:* 5,580 to 5,910 feet  
*Effective annual precipitation:* 12 to 14 inches  
*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Loam  
*Depth to restrictive feature:* Paralithic bedrock: 40 to 60 inches  
*Drainage class:* Well drained  
*Parent material:* Clayey alluvium over volcanic and sedimentary rock  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 8.5 inches  
*Typical profile:*

- A1—0 to 0 inches; loam
- A2—0 to 7 inches; loam
- Bt—7 to 19 inches; clay loam
- Bk—19 to 41 inches; loam
- BCK—41 to 57 inches; sandy clay loam
- Cr—57 to 60 inches; bedrock

#### **Chinasprings, moderately impacted and similar soils**

*Composition:* 25 percent  
*Geomorphic description:* Backslope on south-tending hill  
*Slope:* 15 to 30 percent, east to northwest aspects  
*Elevation:* 5,580 to 5,910 feet  
*Effective annual precipitation:* 12 to 14 inches  
*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Ashy loam  
*Depth to restrictive feature:* Paralithic bedrock: 40 to 60 inches  
*Drainage class:* Well drained  
*Parent material:* Volcanic ash-influenced alluvium over volcanic and sedimentary rock  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 5.9 inches



*Typical profile:*

- A1—0 to 0 inches; ashy loam
- A2—0 to 6 inches; ashy loam
- Bt—6 to 20 inches; ashy gravelly sandy clay loam
- Bk—20 to 44 inches; ashy gravelly sandy loam
- BCk—44 to 58 inches; gravelly ashy sandy loam
- Cr—58 to 79 inches; ashy bedrock

**Nivean, moderately impacted and similar soils**

*Composition:* 25 percent

*Geomorphic description:*

- Backslope on south-tending hill
- Footslope on south-tending hill

*Slope:* 12 to 25 percent, east to northwest aspects

*Elevation:* 5,580 to 5,910 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Gravelly sandy loam

*Depth to restrictive feature:*

- Paralithic bedrock: 10 to 17 inches
- Lithic bedrock: 13 to 20 inches

*Drainage class:* Well drained

*Parent material:* Residuum over rhyolite and/or welded tuff

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 0.8 inches

*Typical profile:*

- A1—0 to 0 inches; gravelly sandy loam
- A2—0 to 4 inches; gravelly sandy loam
- Bw—4 to 10 inches; very gravelly sandy loam
- BC—10 to 13 inches; extremely gravelly coarse sandy loam
- Cr—13 to 17 inches; bedrock
- R—17 to 60 inches; bedrock

**Additional Components**

Travona, moderately impacted and similar soils: 7 percent

Rock outcrop: 3 percent

**584F—Nivean, very stony-Rock outcrop-Whitlash, very stony complex, 20 to 60 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Forestland and rangeland

*Elevation:* 5,460 to 6,170 feet

*Mean annual precipitation:* 14 to 16 inches

*Frost-free period:* 70 to 90 days

**Component Description**

**Nivean, very stony and similar soils**

*Composition:* 45 percent

*Geomorphic description:* Backslope on south-tending hill

*Slope:* 30 to 60 percent, east to northwest aspects

Silver Bow County Area and Parts of Beaverhead and Jefferson Counties, Montana

*Elevation:* 5,460 to 6,170 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Very cobbly coarse sandy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:*

- Paralithic bedrock: 10 to 17 inches
- Lithic bedrock: 13 to 20 inches

*Drainage class:* Well drained

*Parent material:* Residuum over welded tuff and/or rhyolite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 0.8 inches

*Typical profile:*

A—0 to 4 inches; very cobbly coarse sandy loam

Bw—4 to 10 inches; very gravelly sandy loam

BC—10 to 13 inches; extremely gravelly coarse sandy loam

Cr—13 to 17 inches; bedrock

R—17 to 60 inches; bedrock

**Rock outcrop**

*Composition:* 25 percent

**Whitlash, very stony and similar soils**

*Composition:* 20 percent

*Geomorphic description:*

- Backslope on south-tending hill
- Shoulder on south-tending hill

*Slope:* 20 to 50 percent, east to northwest aspects

*Elevation:* 5,460 to 6,170 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Very cobbly coarse sandy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Well drained

*Parent material:* Colluvium and/or residuum over volcanic and sedimentary rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.1 inches

*Typical profile:*

A—0 to 4 inches; very cobbly coarse sandy loam

Bw—4 to 12 inches; very gravelly sandy loam

BC—12 to 15 inches; very gravelly sandy loam

R—15 to 19 inches; bedrock

**Additional Components**

Reedpoint, very stony and similar soils: 10 percent

## **586D—Chinasprings-Patouza-Chinasprings, deep complex, 4 to 15 percent slopes, moderately impacted**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,300 to 5,920 feet

*Mean annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Chinasprings, moderately impacted and similar soils**

*Composition:* 40 percent

*Geomorphic description:* Broad ridges on hill

*Slope:* 4 to 12 percent

*Elevation:* 5,300 to 5,920 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Ashy sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Volcanic ash-influenced alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 6.0 inches

*Typical profile:*

A1—0 to 0 inches; ashy sandy loam

A2—0 to 6 inches; ashy sandy loam

Bt—6 to 16 inches; ashy gravelly sandy clay loam

Bk1—16 to 24 inches; gravelly ashy sandy loam

Bk2—24 to 40 inches; ashy gravelly sandy loam

BCK—40 to 80 inches; ashy gravelly sandy loam

#### **Patouza, moderately impacted and similar soils**

*Composition:* 25 percent

*Geomorphic description:*

- Small alluvial fan
- Footslope on hill

*Slope:* 4 to 12 percent

*Elevation:* 5,300 to 5,920 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* Paralithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Clayey alluvium over volcanic and sedimentary rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 8.5 inches

*Typical profile:*

A1—0 to 0 inches; loam

A2—0 to 7 inches; loam

Bt—7 to 19 inches; clay loam

Bk—19 to 41 inches; loam

BCK—41 to 57 inches; sandy clay loam

Cr—57 to 60 inches; bedrock

**Chinasprings, moderately impacted, deep and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Shoulder on broad ridges on hill

*Slope:* 8 to 15 percent

*Elevation:* 5,300 to 5,920 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Gravelly ashy sandy loam

*Depth to restrictive feature:* Paralithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Volcanic ash-influenced alluvium over volcanic and sedimentary rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.9 inches

*Typical profile:*

A1—0 to 0 inches; gravelly ashy sandy loam

A2—0 to 6 inches; gravelly ashy sandy loam

Bt—6 to 20 inches; gravelly ashy sandy clay loam

Bk—20 to 44 inches; ashy gravelly sandy loam

BCK—44 to 58 inches; ashy gravelly sandy loam

Cr—58 to 79 inches; ashy bedrock

**Additional Components**

Rock outcrop: 8 percent

Travona, moderately impacted and similar soils: 7 percent

**587E—Nivean very gravelly sandy loam, 15 to 30 percent slopes, moderately impacted**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,170 to 5,860 feet

*Mean annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

**Component Description**

**Nivean, moderately impacted and similar soils**

*Composition:* 75 percent

*Geomorphic description:* Backslope on south-tending hill

*Slope:* 15 to 30 percent, east to northwest aspects

*Elevation:* 5,170 to 5,860 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Very gravelly sandy loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:*

- Paralithic bedrock: 10 to 17 inches
- Lithic bedrock: 13 to 20 inches

*Drainage class:* Well drained

*Parent material:* Residuum over welded tuff and/or rhyolite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 0.8 inches

*Typical profile:*

A1—0 to 0 inches; very gravelly sandy loam

A2—0 to 4 inches; very gravelly sandy loam

Bw—4 to 10 inches; very gravelly sandy loam

BC—10 to 13 inches; extremely gravelly coarse sandy loam

Cr—13 to 17 inches; bedrock

R—17 to 60 inches; bedrock

### **Additional Components**

Reedpoint, moderately impacted, stony and similar soils: 10 percent

Chinasprings, moderately impacted, deep and similar soils: 5 percent

Rivra, moderately impacted and similar soils: 5 percent

Rock outcrop: 5 percent

## **589E—Nivean-Patouza complex, 8 to 35 percent slopes, very stony, moderately impacted**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,300 to 6,270 feet

*Mean annual precipitation:* 12 to 16 inches

*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Nivean, moderately impacted, very stony and similar soils**

*Composition:* 55 percent

*Geomorphic description:* Backslope on south-tending hill

*Slope:* 15 to 35 percent, east to west aspects

*Elevation:* 5,300 to 6,270 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Gravelly sandy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:*

- Paralithic bedrock: 10 to 17 inches
- Lithic bedrock: 13 to 20 inches

*Drainage class:* Well drained

*Parent material:* Residuum over welded tuff and/or rhyolite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 0.8 inches

*Typical profile:*

A1—0 to 0 inches; gravelly sandy loam

A2—0 to 4 inches; gravelly sandy loam

Bw—4 to 10 inches; very gravelly sandy loam

BC—10 to 13 inches; extremely gravelly coarse sandy loam

Cr—13 to 17 inches; bedrock

R—17 to 60 inches; bedrock

**Patouza, moderately impacted, very stony and similar soils**

*Composition:* 20 percent

*Geomorphic description:*

- Foothlope on south-tending hill
- South-tending swale

*Slope:* 8 to 25 percent, east to west aspects

*Elevation:* 5,300 to 6,270 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* Paralithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Clayey alluvium over volcanic and sedimentary rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 8.5 inches

*Typical profile:*

A1—0 to 0 inches; loam

A2—0 to 7 inches; loam

Bt—7 to 19 inches; clay loam

Bk—19 to 41 inches; loam

BCk—41 to 57 inches; sandy clay loam

Cr—57 to 60 inches; bedrock

**Additional Components**

Rock outcrop: 10 percent

Whitlash, moderately impacted, very stony and similar soils: 10 percent

Reedpoint, moderately impacted, very stony and similar soils: 5 percent

**593F—Nivean-Patouza-Whitlash complex, 20 to 50 percent slopes, very stony, moderately impacted**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,530 to 6,300 feet

*Mean annual precipitation:* 12 to 16 inches

*Frost-free period:* 70 to 90 days

**Component Description**

**Nivean, moderately impacted, very stony and similar soils**

*Composition:* 50 percent

*Geomorphic description:* Backslope on south-tending hill

*Slope:* 30 to 50 percent, east to west aspects

*Elevation:* 5,530 to 6,300 feet

*Effective annual precipitation:* 10 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Gravelly sandy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:*

- Paralithic bedrock: 10 to 17 inches
- Lithic bedrock: 13 to 20 inches

*Drainage class:* Well drained

*Parent material:* Residuum over rhyolite and/or welded tuff

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 0.8 inches

*Typical profile:*

A1—0 to 0 inches; gravelly sandy loam

A2—0 to 4 inches; gravelly sandy loam

Bw—4 to 10 inches; very gravelly sandy loam

BC—10 to 13 inches; extremely gravelly coarse sandy loam

Cr—13 to 17 inches; bedrock

R—17 to 60 inches; bedrock

**Patouza, moderately impacted, very stony and similar soils**

*Composition:* 20 percent

*Geomorphic description:*

- Footslope on south-tending hill
- South-tending swale

*Slope:* 20 to 40 percent, east to west aspects

*Elevation:* 5,530 to 6,300 feet

*Effective annual precipitation:* 10 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* Paralithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Clayey alluvium over volcanic and sedimentary rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 8.5 inches

*Typical profile:*

A1—0 to 0 inches; loam

A2—0 to 7 inches; loam

Bt—7 to 19 inches; clay loam

Bk—19 to 41 inches; loam

BCk—41 to 57 inches; sandy clay loam

Cr—57 to 60 inches; bedrock

**Whitlash, moderately impacted, very stony and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Shoulder on south-tending ridges on hill

*Slope:* 20 to 35 percent, east to west aspects

*Elevation:* 5,530 to 6,300 feet

*Effective annual precipitation:* 10 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Very gravelly sandy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Well drained

*Parent material:* Colluvium and/or residuum over volcanic and sedimentary rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.1 inches

*Typical profile:*

A1—0 to 0 inches; very gravelly sandy loam  
A2—0 to 4 inches; very gravelly sandy loam  
Bw—4 to 12 inches; very gravelly sandy loam  
BC—12 to 15 inches; very gravelly sandy loam  
R—15 to 19 inches; bedrock

**Additional Components**

Rock outcrop: 10 percent  
Reedpoint, moderately impacted, very stony and similar soils: 5 percent

**594D—Evaro-Savenac complex, 4 to 15 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Forestland  
*Elevation:* 5,870 to 6,920 feet  
*Mean annual precipitation:* 17 to 19 inches  
*Frost-free period:* 30 to 50 days

**Component Description**

**Evaro and similar soils**

*Composition:* 60 percent  
*Geomorphic description:* Mountainbase on mountain  
*Slope:* 8 to 15 percent  
*Elevation:* 5,870 to 6,920 feet  
*Effective annual precipitation:* 17 to 19 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Gravelly ashy loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Somewhat excessively drained  
*Parent material:* Colluvium over volcanic rock  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 4.3 inches  
*Typical profile:*  
Oi—0 to 1 inches; slightly decomposed plant material  
Oe—1 to 3 inches; moderately decomposed plant material  
A—3 to 8 inches; gravelly ashy loam  
E—8 to 21 inches; very gravelly sandy loam  
E and Bt—21 to 60 inches; very gravelly sandy clay loam

**Savenac and similar soils**

*Composition:* 25 percent  
*Geomorphic description:* Drainageway  
*Slope:* 4 to 15 percent  
*Elevation:* 5,870 to 6,920 feet  
*Effective annual precipitation:* 17 to 19 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Ashy loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Moderately well drained  
*Parent material:* Volcanic ash and/or loess over clayey colluvium derived from volcanic rock



*Native plant cover type:* Forestland

*Flooding:* None

*Water table:* Present

*Available water capacity:* Mainly 8.0 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

E—2 to 12 inches; ashy loam

E/Bt—12 to 28 inches; sandy clay loam

Bt—28 to 37 inches; clay loam

BC—37 to 60 inches; gravelly sandy loam

### **Additional Components**

Evapo, greater slopes and similar soils: 10 percent

Euell, meadow and similar soils: 5 percent

## **595D—Mooseflat, very stony-Pappascreek, very stony-Euell complex, 2 to 15 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Riparian and rangeland

*Elevation:* 5,100 to 6,690 feet

*Mean annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Mooseflat, very stony and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Drainageway

*Slope:* 2 to 8 percent

*Elevation:* 5,100 to 6,690 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Mucky peat

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Very poorly drained

*Parent material:* Mixed alluvium over alluvium derived from volcanic rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Water table:* Present

*Available water capacity:* Mainly 5.1 inches

*Typical profile:*

Oe—0 to 5 inches; mucky peat

A—5 to 14 inches; loam

Bg—14 to 28 inches; sandy clay loam

2Cg—28 to 72 inches; very gravelly coarse sand

#### **Pappascreek, very stony and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Toeslope on hill

*Slope:* 4 to 12 percent

*Elevation:* 5,100 to 6,690 feet

*Effective annual precipitation:* 14 to 16 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Mucky peat  
*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Somewhat poorly drained  
*Parent material:* Mixed alluvium over alluvium derived from volcanic rock  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Water table:* Present  
*Available water capacity:* Mainly 7.1 inches  
*Typical profile:*  
Oe—0 to 3 inches; mucky peat  
A—3 to 25 inches; loam  
C—25 to 54 inches; stratified silt loam to loam to coarse sandy loam  
2C—54 to 72 inches; gravelly coarse sand

**Euell and similar soils**

*Composition:* 25 percent  
*Geomorphic description:* Footslope on hill  
*Slope:* 8 to 15 percent  
*Elevation:* 5,100 to 6,690 feet  
*Effective annual precipitation:* 14 to 16 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Gravelly ashy sandy loam  
*Depth to restrictive feature:* Lithic bedrock: 40 to 60 inches  
*Drainage class:* Well drained  
*Parent material:* Loamy skeletal colluvium over volcanic rock  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 5.1 inches  
*Typical profile:*  
A—0 to 10 inches; gravelly ashy sandy loam  
Bt—10 to 26 inches; very gravelly ashy sandy clay loam  
BC—26 to 58 inches; very gravelly ashy sandy loam  
R—58 to 60 inches; bedrock

**Additional Components**

Hungryhill and similar soils: 5 percent

**596D—Bigbutte, stony-Euell, stony-Rock outcrop complex, 4 to 15 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,360 to 5,920 feet  
*Mean annual precipitation:* 15 to 17 inches  
*Frost-free period:* 50 to 70 days

**Component Description**

**Bigbutte, stony and similar soils**

*Composition:* 55 percent  
*Geomorphic description:* Structural bench

*Slope:* 6 to 15 percent

*Elevation:* 5,360 to 5,920 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Ashy sandy loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:*

- Paralithic bedrock: 20 to 40 inches
- Lithic bedrock: 28 to 60 inches

*Drainage class:* Well drained

*Parent material:* Volcanic ash-influenced colluvium over volcanic and sedimentary rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.3 inches

*Typical profile:*

- A—0 to 8 inches; ashy sandy loam
- Bw—8 to 17 inches; gravelly ashy sandy loam
- BC—17 to 30 inches; gravelly ashy sandy loam
- Cr—30 to 36 inches; bedrock
- R—36 to 60 inches; bedrock

#### **Euell, stony and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Swales and footslopes on structural bench

*Slope:* 4 to 12 percent

*Elevation:* 5,360 to 5,920 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly ashy sandy loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* Lithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Loamy skeletal colluvium over volcanic rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.1 inches

*Typical profile:*

- A—0 to 10 inches; gravelly ashy sandy loam
- Bt—10 to 26 inches; very gravelly ashy sandy clay loam
- BC—26 to 58 inches; very gravelly ashy sandy loam
- R—58 to 60 inches; bedrock

#### **Rock outcrop**

*Composition:* 15 percent

### **Additional Components**

Poin, very stony and similar soils: 7 percent

Larkspur, very stony and similar soils: 3 percent

## **597C—Kilgore-Foolhen-Philipsburg complex, 2 to 12 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Riparian

*Elevation:* 5,350 to 7,050 feet

*Mean annual precipitation:* 15 to 19 inches

*Frost-free period:* 30 to 50 days

### **Component Description**

#### **Kilgore and similar soils**

*Composition:* 45 percent

*Geomorphic description:* Drainageway

*Slope:* 2 to 4 percent

*Elevation:* 5,350 to 7,050 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Silt loam

*Depth to restrictive feature:* None noted

*Drainage class:* Poorly drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Water table:* Present

*Available water capacity:* Mainly 6.4 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

A—2 to 19 inches; silt loam

Ag—19 to 29 inches; loam

2Cg—29 to 38 inches; gravelly sandy loam

2C—38 to 60 inches; very gravelly coarse sand

#### **Foolhen and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Drainageway

*Slope:* 2 to 6 percent

*Elevation:* 5,350 to 7,050 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Poorly drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Water table:* Present

*Available water capacity:* Mainly 9.5 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

A—2 to 13 inches; loam

Bw—13 to 26 inches; loam

C1—26 to 39 inches; sandy clay loam

C2—39 to 60 inches; sandy clay loam

**Philipsburg, wet and similar soils**

*Composition:* 15 percent  
*Geomorphic description:* Toeslope on hill  
*Slope:* 4 to 12 percent  
*Elevation:* 5,350 to 7,050 feet  
*Effective annual precipitation:* 15 to 19 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Moderately well drained  
*Parent material:* Alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Water table:* Present  
*Available water capacity:* Mainly 9.2 inches  
*Typical profile:*  
A—0 to 9 inches; loam  
Bt—9 to 22 inches; clay loam  
Bk—22 to 40 inches; gravelly loam  
BC—40 to 44 inches; gravelly loam  
C—44 to 60 inches; gravelly loam

**Additional Components**

Euell, stony and similar soils: 5 percent

**598E—Chinasprings-Whitlash-Dutton complex, 8 to 30 percent slopes, stony**

**Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,560 to 6,050 feet  
*Mean annual precipitation:* 13 to 16 inches  
*Frost-free period:* 70 to 90 days

**Component Description**

**Chinasprings, stony and similar soils**

*Composition:* 35 percent  
*Geomorphic description:* Backslope on hill  
*Slope:* 8 to 25 percent, east to northwest aspects  
*Elevation:* 5,560 to 6,050 feet  
*Effective annual precipitation:* 10 to 14 inches  
*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Ashy gravelly sandy loam  
*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart  
*Depth to restrictive feature:* Paralithic bedrock: 40 to 60 inches  
*Drainage class:* Well drained  
*Parent material:* Volcanic ash-influenced alluvium over volcanic and sedimentary rock  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 5.9 inches  
*Typical profile:*  
A—0 to 6 inches; ashy gravelly sandy loam  
Bt—6 to 20 inches; ashy gravelly sandy clay loam

Bk—20 to 44 inches; gravelly ashy sandy loam  
BCk—44 to 58 inches; ashy gravelly sandy loam  
Cr—58 to 79 inches; ashy bedrock

**Whitlash, stony and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Backslope on hill

*Slope:* 15 to 30 percent, east to northwest aspects

*Elevation:* 5,560 to 6,050 feet

*Effective annual precipitation:* 10 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Very gravelly sandy loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Well drained

*Parent material:* Colluvium and/or residuum over volcanic and sedimentary rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.1 inches

*Typical profile:*

A—0 to 4 inches; very gravelly sandy loam

Bw—4 to 12 inches; very gravelly sandy loam

BC—12 to 15 inches; very gravelly sandy loam

R—15 to 19 inches; bedrock

**Dutton, stony and similar soils**

*Composition:* 15 percent

*Geomorphic description:*

- Footslope on hill
- Swale

*Slope:* 8 to 15 percent, east to northwest aspects

*Elevation:* 5,560 to 6,050 feet

*Effective annual precipitation:* 10 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* Paralithic bedrock: 20 to 40 inches

*Drainage class:* Well drained

*Parent material:* Clayey alluvium and/or residuum over interbedded sandstone and shale

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.8 inches

*Typical profile:*

A—0 to 8 inches; loam

Bt—8 to 18 inches; clay loam

Bk—18 to 34 inches; clay loam

Cr—34 to 44 inches; bedrock

**Additional Components**

Rock outcrop: 12 percent

Reedpoint, stony and similar soils: 8 percent

## **601D—Nissler-Kilgore-Pappascreek, very stony complex, 2 to 15 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Riparian and rangeland

*Elevation:* 5,460 to 7,120 feet

*Mean annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Nissler and similar soils**

*Composition:* 40 percent

*Geomorphic description:* Footslope on low hill

*Slope:* 6 to 15 percent

*Elevation:* 5,460 to 7,120 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Ashy sandy loam

*Depth to restrictive feature:* Lithic bedrock: 60 to 79 inches

*Drainage class:* Well drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.9 inches

*Typical profile:*

A—0 to 8 inches; ashy sandy loam

Bt—8 to 22 inches; ashy sandy clay loam

BC—22 to 60 inches; gravelly ashy sandy loam

R—60 to 70 inches; bedrock

#### **Kilgore and similar soils**

*Composition:* 25 percent

*Geomorphic description:* Drainageway

*Slope:* 2 to 6 percent

*Elevation:* 5,460 to 7,120 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Silt loam

*Depth to restrictive feature:* None noted

*Drainage class:* Poorly drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Water table:* Present

*Available water capacity:* Mainly 6.4 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

A—2 to 19 inches; silt loam

Ag—19 to 29 inches; loam

2Cg—29 to 38 inches; gravelly sandy loam

2C—38 to 60 inches; very gravelly coarse sand

**Pappascreek, very stony and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Toeslope on low hill

*Slope:* 6 to 12 percent

*Elevation:* 5,460 to 7,120 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Mucky peat

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Somewhat poorly drained

*Parent material:* Mixed alluvium over alluvium derived from volcanic rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Water table:* Present

*Available water capacity:* Mainly 7.1 inches

*Typical profile:*

Oe—0 to 3 inches; mucky peat

A—3 to 25 inches; loam

C—25 to 54 inches; stratified silt loam to loam to coarse sandy loam

2C—54 to 72 inches; gravelly coarse sand

**Additional Components**

Browns gulch and similar soils: 10 percent

Mooseflat, very stony and similar soils: 5 percent

**608E—Illiano, very stony-Euell, very stony-Rock outcrop complex, 8 to 30 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Forestland

*Elevation:* 5,430 to 6,770 feet

*Mean annual precipitation:* 13 to 15 inches

*Frost-free period:* 50 to 70 days

**Component Description**

**Illiano, very stony and similar soils**

*Composition:* 30 percent

*Geomorphic description:*

- Backslope on mountain
- Shoulder on mountain

*Slope:* 15 to 30 percent, east to northwest aspects

*Elevation:* 5,430 to 6,770 feet

*Effective annual precipitation:* 11 to 14 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very cobbly sandy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Well drained

*Parent material:* Residuum over rhyolite and/or welded tuff

*Native plant cover type:* Forestland

*Flooding:* None



*Available water capacity:* Mainly 0.9 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

A—1 to 6 inches; very cobbly sandy loam

Bw—6 to 17 inches; very cobbly sandy loam

R—17 to 60 inches; bedrock

**Euell, very stony and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Backslope on south-tending mountain

*Slope:* 8 to 30 percent, east to northwest aspects

*Elevation:* 5,430 to 6,770 feet

*Effective annual precipitation:* 11 to 14 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly ashy sandy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* Lithic bedrock: 40 to 60 inches

*Drainage class:* Well drained

*Parent material:* Loamy skeletal colluvium over volcanic rock

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 5.1 inches

*Typical profile:*

A—0 to 10 inches; gravelly ashy sandy loam

Bt—10 to 26 inches; very gravelly ashy sandy clay loam

BC—26 to 58 inches; very gravelly ashy sandy loam

R—58 to 60 inches; bedrock

**Rock outcrop**

*Composition:* 20 percent

**Additional Components**

Browns gulch and similar soils: 10 percent

Germangulch, very stony and similar soils: 10 percent

Larkspur, extremely stony and similar soils: 10 percent

**612A—Kilgore, frequently flooded-Foxgulch, rarely  
flooded complex, 0 to 4 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Riparian

*Elevation:* 5,450 to 6,920 feet

*Mean annual precipitation:* 14 to 19 inches

*Frost-free period:* 50 to 70 days

**Component Description**

**Kilgore and similar soils**

*Composition:* 70 percent

*Geomorphic description:* Flood plain

*Slope:* 0 to 2 percent

*Elevation:* 5,450 to 6,920 feet

*Effective annual precipitation:* 14 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Silty clay loam

*Depth to restrictive feature:* None noted

*Drainage class:* Poorly drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* Frequent

*Water table:* Present

*Available water capacity:* Mainly 6.4 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

A—2 to 19 inches; silty clay loam

Ag—19 to 29 inches; loam

2Cg—29 to 38 inches; gravelly sandy loam

2C—38 to 60 inches; very gravelly coarse sand

### **Foxgulch and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Flood-plain step

*Slope:* 1 to 4 percent

*Elevation:* 5,450 to 6,920 feet

*Effective annual precipitation:* 14 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Somewhat poorly drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* Rare

*Water table:* Present

*Available water capacity:* Mainly 7.8 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

A—1 to 12 inches; loam

Bw—12 to 30 inches; loam

BC—30 to 46 inches; sandy clay loam

2C—46 to 60 inches; very gravelly coarse sand

### **Additional Components**

Browngulch and similar soils: 5 percent

Mooseflat and similar soils: 5 percent

## **614B—Browngulch-Foxgulch complex, 2 to 6 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,510 to 5,720 feet

*Mean annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

### Component Description

#### **Browns gulch and similar soils**

*Composition:* 75 percent

*Geomorphic description:* Alluvial fan

*Slope:* 2 to 6 percent

*Elevation:* 5,510 to 5,720 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Coarse loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 7.4 inches

*Typical profile:*

A1—0 to 6 inches; loam

A2—6 to 14 inches; loam

A3—14 to 22 inches; gravelly sandy loam

Bw—22 to 34 inches; gravelly sandy loam

C—34 to 60 inches; gravelly sandy loam

#### **Fox gulch and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Alluvial fan

*Slope:* 2 to 4 percent

*Elevation:* 5,510 to 5,720 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Somewhat poorly drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Water table:* Present

*Available water capacity:* Mainly 7.8 inches

*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material

A—1 to 12 inches; loam

Bw—12 to 30 inches; loam

BC—30 to 46 inches; sandy clay loam

2C—46 to 60 inches; very gravelly coarse sand

### Additional Components

Browns gulch, greater slopes and similar soils: 5 percent

## **616D—Silas-Vitroff complex, 2 to 15 percent slopes**

### Map Unit Setting

*Interpretive focus:* Riparian

*Elevation:* 6,280 to 7,000 feet

*Mean annual precipitation:* 19 to 24 inches

*Frost-free period:* 30 to 50 days

### **Component Description**

#### **Silas and similar soils**

*Composition:* 65 percent

*Geomorphic description:* Drainageway

*Slope:* 2 to 8 percent

*Elevation:* 6,280 to 7,000 feet

*Effective annual precipitation:* 19 to 24 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Moderately well drained

*Parent material:* Mixed alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Water table:* Present

*Available water capacity:* Mainly 11.0 inches

*Typical profile:*

Oe—0 to 2 inches; moderately decomposed plant material

A1—2 to 18 inches; loam

A2—18 to 38 inches; loam

C—38 to 72 inches; loam

#### **Vitroff and similar soils**

*Composition:* 25 percent

*Geomorphic description:* Footslope on mountain slope

*Slope:* 4 to 15 percent

*Elevation:* 6,280 to 7,000 feet

*Effective annual precipitation:* 19 to 24 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Ashy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Tuffaceous colluvium and/or slope alluvium derived from volcanic rock

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 6.1 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

E1—2 to 7 inches; ashy loam

E2—7 to 13 inches; gravelly ashy sandy loam

Bt and E—13 to 21 inches; gravelly ashy sandy clay loam

Bt—21 to 33 inches; gravelly ashy sandy clay loam

BC—33 to 60 inches; very gravelly ashy sandy loam

### **Additional Components**

Foolhen and similar soils: 10 percent

## 701E—Rubick-Stecum complex, 15 to 45 percent slopes

### Map Unit Setting

*Interpretive focus:* Forestland  
*Elevation:* 5,790 to 7,630 feet  
*Mean annual precipitation:* 17 to 20 inches  
*Frost-free period:* 30 to 50 days

### Component Description

#### Rubick and similar soils

*Composition:* 60 percent  
*Geomorphic description:* Backslope on mountain  
*Slope:* 15 to 45 percent, west to east aspects  
*Elevation:* 5,790 to 7,630 feet  
*Effective annual precipitation:* 19 to 24 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Gravelly loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Somewhat excessively drained  
*Parent material:* Colluvium derived from argillite  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 3.4 inches  
*Typical profile:*  
    Oi—0 to 2 inches; slightly decomposed plant material  
    E1—2 to 7 inches; gravelly loam  
    E2—7 to 12 inches; very cobbly sandy loam  
    Bw—12 to 22 inches; very cobbly sandy loam  
    BC—22 to 60 inches; very channery sandy loam

#### Stecum and similar soils

*Composition:* 25 percent  
*Geomorphic description:*  
    • Backslope on mountain  
    • Shoulder on mountain  
*Slope:* 15 to 45 percent, west to east aspects  
*Elevation:* 5,790 to 7,630 feet  
*Effective annual precipitation:* 19 to 24 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Gravelly coarse sandy loam  
*Depth to restrictive feature:*  
    • Paralithic bedrock: 20 to 40 inches  
    • Lithic bedrock: 24 to 48 inches  
*Drainage class:* Somewhat excessively drained  
*Parent material:* Colluvium derived from argillite over residuum weathered from granite  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 1.2 inches  
*Typical profile:*  
    Oi—0 to 1 inches; slightly decomposed plant material  
    A—1 to 7 inches; gravelly coarse sandy loam  
    BC—7 to 25 inches; very stony coarse sand  
    Cr—25 to 38 inches; bedrock  
    R—38 to 48 inches; bedrock

### **Additional Components**

Libeg and similar soils: 14 percent  
Rock outcrop: 1 percent

## **702E—Maurice, very stony-Maurice-Sigbird, very stony complex, 12 to 35 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland and forestland  
*Elevation:* 6,120 to 7,790 feet  
*Mean annual precipitation:* 18 to 21 inches  
*Frost-free period:* 30 to 50 days

### **Component Description**

#### **Maurice, very stony and similar soils**

*Composition:* 50 percent  
*Geomorphic description:* Nose slope backslope on mountain  
*Slope:* 15 to 35 percent, east to northwest aspects  
*Elevation:* 6,120 to 7,790 feet  
*Effective annual precipitation:* 17 to 19 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Gravelly loam  
*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Colluvium derived from argillite  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 5.6 inches  
*Typical profile:*  
    A1—0 to 5 inches; gravelly loam  
    A2—5 to 12 inches; very channery loam  
    Bw—12 to 21 inches; very channery loam  
    BC—21 to 33 inches; very channery loam  
    C—33 to 60 inches; very channery loam

#### **Maurice and similar soils**

*Composition:* 25 percent  
*Geomorphic description:* Nose slope backslope on mountain  
*Slope:* 12 to 25 percent, east to northwest aspects  
*Elevation:* 6,120 to 7,790 feet  
*Effective annual precipitation:* 17 to 19 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Colluvium derived from argillite  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 5.6 inches

*Typical profile:*

- A1—0 to 5 inches; loam
- A2—5 to 12 inches; very channery loam
- Bw—12 to 21 inches; very channery loam
- BC—21 to 33 inches; very channery loam
- C—33 to 60 inches; very channery loam

**Sigbird, very stony and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Nose slope backslope on mountain

*Slope:* 12 to 35 percent, east to northwest aspects

*Elevation:* 6,120 to 7,790 feet

*Effective annual precipitation:* 17 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Very channery loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from argillite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 1.1 inches

*Typical profile:*

- A—0 to 5 inches; very channery loam
- Bw—5 to 12 inches; very channery loam
- C—12 to 14 inches; extremely channery sandy loam
- R—14 to 60 inches; bedrock

**Additional Components**

Zonite, extremely stony and similar soils: 7 percent

Rock outcrop: 3 percent

**703G—Surdal, very stony-Rubble land complex, 30 to 70 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,280 to 7,140 feet

*Mean annual precipitation:* 17 to 21 inches

*Frost-free period:* 50 to 70 days

**Component Description**

**Surdal, very stony and similar soils**

*Composition:* 50 percent

*Geomorphic description:* Backslope on mountain

*Slope:* 30 to 70 percent, east to northwest aspects

*Elevation:* 5,280 to 7,140 feet

*Effective annual precipitation:* 15 to 18 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very channery loam

*Rock fragments on the soil surface:* 0.10 to 5.00 percent stones, 3 to 40 feet apart

*Depth to restrictive feature:* Lithic bedrock: 20 to 40 inches

*Drainage class:* Well drained

*Parent material:* Colluvium over residuum weathered from argillite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.9 inches

*Typical profile:*

A—0 to 7 inches; very channery loam

Bw—7 to 16 inches; very channery sandy loam

BC—16 to 28 inches; extremely channery sandy loam

R—28 to 60 inches; bedrock

#### **Rubble land**

*Composition:* 30 percent

### **Additional Components**

Sigbird and similar soils: 10 percent

Rock outcrop: 5 percent

Tiban, very stony and similar soils: 5 percent

## **706E—Rubick-Libeg complex, 8 to 35 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Forestland and rangeland

*Elevation:* 6,000 to 7,860 feet

*Mean annual precipitation:* 15 to 20 inches

*Frost-free period:* 30 to 50 days

### **Component Description**

#### **Rubick and similar soils**

*Composition:* 65 percent

*Geomorphic description:* Backslope on mountain

*Slope:* 12 to 35 percent

*Elevation:* 6,000 to 7,860 feet

*Effective annual precipitation:* 17 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Very cobbly loam

*Depth to restrictive feature:* None noted

*Drainage class:* Somewhat excessively drained

*Parent material:* Colluvium derived from argillite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 3.4 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

E1—2 to 7 inches; very cobbly loam

E2—7 to 12 inches; very cobbly sandy loam

Bw—12 to 22 inches; very cobbly sandy loam

BC—22 to 60 inches; very channery sandy loam

#### **Libeg and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Backslope on mountain

*Slope:* 8 to 30 percent



*Elevation:* 6,000 to 7,860 feet  
*Effective annual precipitation:* 17 to 19 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Channery loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Colluvium derived from argillite  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 6.4 inches  
*Typical profile:*  
    A—0 to 12 inches; channery loam  
    Bt—12 to 24 inches; very channery loam  
    BC—24 to 60 inches; very channery loam

#### **Additional Components**

Bullrey and similar soils: 10 percent  
Moosejaw and similar soils: 3 percent  
Rock outcrop: 2 percent

### **708D—Rubick-Moosejaw complex, 4 to 20 percent slopes**

#### **Map Unit Setting**

*Interpretive focus:* Riparian and forestland  
*Elevation:* 5,810 to 7,220 feet  
*Mean annual precipitation:* 19 to 24 inches  
*Frost-free period:* 30 to 50 days

#### **Component Description**

##### **Rubick and similar soils**

*Composition:* 50 percent  
*Geomorphic description:* Backslope on slumped mountain  
*Slope:* 8 to 20 percent  
*Elevation:* 5,810 to 7,220 feet  
*Effective annual precipitation:* 19 to 24 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Very cobbly loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Somewhat excessively drained  
*Parent material:* Colluvium derived from argillite  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 3.4 inches  
*Typical profile:*  
    Oi—0 to 2 inches; slightly decomposed plant material  
    E1—2 to 7 inches; very cobbly loam  
    E2—7 to 12 inches; very cobbly sandy loam  
    Bw—12 to 22 inches; very cobbly sandy loam  
    BC—22 to 60 inches; very channery sandy loam

##### **Moosejaw and similar soils**

*Composition:* 40 percent  
*Geomorphic description:* Toeslope on mountain

*Slope:* 4 to 12 percent  
*Elevation:* 5,810 to 7,220 feet  
*Effective annual precipitation:* 19 to 24 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Mucky peat  
*Depth to restrictive feature:* None noted  
*Drainage class:* Very poorly drained  
*Parent material:* Mixed alluvium over alluvium derived from sandstone  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Water table:* Present  
*Available water capacity:* Mainly 4.5 inches  
*Typical profile:*  
Oe—0 to 4 inches; mucky peat  
A—4 to 22 inches; gravelly sandy loam  
Cg—22 to 48 inches; sandy loam  
2Cg—48 to 72 inches; very gravelly coarse sand

#### **Additional Components**

Tepete and similar soils: 10 percent

### **709E—Libeg-Monad-Copenhaver complex, 15 to 35 percent slopes**

#### **Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,300 to 7,680 feet  
*Mean annual precipitation:* 15 to 23 inches  
*Frost-free period:* 30 to 80 days

#### **Component Description**

##### **Libeg and similar soils**

*Composition:* 40 percent  
*Geomorphic description:* Backslope on mountain  
*Slope:* 15 to 35 percent  
*Elevation:* 5,300 to 7,680 feet  
*Effective annual precipitation:* 18 to 23 inches  
*Frost-free period:* 30 to 70 days  
*Surface layer texture:* Gravelly loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Gravelly colluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 5.4 inches  
*Typical profile:*  
A—0 to 14 inches; gravelly loam  
Bt—14 to 60 inches; very channery clay loam

##### **Monad and similar soils**

*Composition:* 25 percent  
*Geomorphic description:* Summit on mountain

*Slope:* 15 to 35 percent  
*Elevation:* 5,300 to 7,680 feet  
*Effective annual precipitation:* 18 to 23 inches  
*Frost-free period:* 30 to 70 days  
*Surface layer texture:* Loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Fine-loamy alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 8.1 inches  
*Typical profile:*  
    A—0 to 11 inches; loam  
    Bt/E—11 to 25 inches; sandy clay loam  
    Bt—25 to 60 inches; stony clay loam

**Copenhaver and similar soils**

*Composition:* 20 percent  
*Geomorphic description:* Backslope on mountain  
*Slope:* 15 to 35 percent  
*Elevation:* 5,300 to 7,680 feet  
*Effective annual precipitation:* 18 to 23 inches  
*Frost-free period:* 30 to 70 days  
*Surface layer texture:* Gravelly loam  
*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches  
*Drainage class:* Well drained  
*Parent material:* Residuum weathered from quartzite and/or residuum weathered from andesite and/or residuum weathered from basalt  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 1.4 inches  
*Typical profile:*  
    A—0 to 5 inches; gravelly loam  
    Bt—5 to 14 inches; very gravelly clay loam  
    R—14 to 60 inches; unweathered bedrock

**Additional Components**

*Libeg, greater slopes and similar soils:* 7 percent  
Rock outcrop: 4 percent  
Roy and similar soils: 4 percent

**710E—Worock gravelly loam, dry, 15 to 35 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Forestland  
*Elevation:* 5,900 to 7,350 feet  
*Mean annual precipitation:* 19 to 30 inches  
*Frost-free period:* 30 to 50 days

**Component Description**

**Worock and similar soils**

*Composition:* 85 percent  
*Geomorphic description:* Mountain slope

*Slope:* 15 to 35 percent  
*Elevation:* 5,900 to 7,350 feet  
*Effective annual precipitation:* 19 to 30 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Gravelly loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Gravelly colluvium  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 5.5 inches  
*Typical profile:*  
Oe—0 to 1 inches; moderately decomposed plant material  
E—1 to 6 inches; gravelly loam  
E/Bt—6 to 19 inches; gravelly clay loam  
Bt—19 to 39 inches; very gravelly clay loam  
BC—39 to 60 inches; very gravelly sandy clay loam

#### **Additional Components**

Evano and similar soils: 4 percent  
Loberg and similar soils: 4 percent  
Rock outcrop: 4 percent  
Danaher and similar soils: 3 percent

### **711E—Worock gravelly loam, 15 to 35 percent slopes**

#### **Map Unit Setting**

*Interpretive focus:* Forestland  
*Elevation:* 5,610 to 8,100 feet  
*Mean annual precipitation:* 18 to 25 inches  
*Frost-free period:* 30 to 50 days

#### **Component Description**

##### **Worock and similar soils**

*Composition:* 85 percent  
*Geomorphic description:* Mountain slope  
*Slope:* 15 to 35 percent  
*Elevation:* 5,610 to 8,100 feet  
*Effective annual precipitation:* 20 to 25 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Gravelly loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Gravelly colluvium  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 5.5 inches  
*Typical profile:*  
Oe—0 to 1 inches; moderately decomposed plant material  
E—1 to 6 inches; gravelly loam  
E/Bt—6 to 19 inches; gravelly clay loam  
Bt—19 to 39 inches; very gravelly clay loam  
BC—39 to 60 inches; very gravelly sandy clay loam

### **Additional Components**

Elve and similar soils: 5 percent  
Loberg and similar soils: 4 percent  
Danaher and similar soils: 3 percent  
Evaro and similar soils: 3 percent

## **712F—Rubick-Maurice complex, 20 to 50 percent slopes, very stony**

### **Map Unit Setting**

*Interpretive focus:* Forestland and rangeland  
*Elevation:* 5,990 to 7,810 feet  
*Mean annual precipitation:* 17 to 20 inches  
*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Rubick, very stony and similar soils**

*Composition:* 50 percent  
*Geomorphic description:* Mountain slope  
*Slope:* 20 to 50 percent, east to northwest aspects  
*Elevation:* 5,990 to 7,810 feet  
*Effective annual precipitation:* 15 to 18 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Very channery loam  
*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Somewhat excessively drained  
*Parent material:* Gravelly colluvium  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 3.4 inches  
*Typical profile:*  
    Oi—0 to 2 inches; slightly decomposed plant material  
    E1—2 to 7 inches; very channery loam  
    E2—7 to 12 inches; very cobbly sandy loam  
    Bw—12 to 22 inches; very cobbly sandy loam  
    BC—22 to 60 inches; very channery sandy loam

#### **Maurice, very stony and similar soils**

*Composition:* 25 percent  
*Geomorphic description:* Meadows on mountain slope  
*Slope:* 20 to 50 percent, east to northwest aspects  
*Elevation:* 5,990 to 7,810 feet  
*Effective annual precipitation:* 15 to 18 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Channery loam  
*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Colluvium derived from argillite  
*Native plant cover type:* Rangeland  
*Flooding:* None

*Available water capacity:* Mainly 5.6 inches

*Typical profile:*

A1—0 to 5 inches; channery loam

A2—5 to 12 inches; very channery loam

Bw—12 to 21 inches; very channery loam

BC—21 to 33 inches; very channery loam

C—33 to 60 inches; very channery loam

### **Additional Components**

Mawspring, very stony and similar soils: 14 percent

Sigbird, very stony and similar soils: 10 percent

Rock outcrop: 1 percent

## **713F—Elve gravelly loam, 35 to 60 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Forestland

*Elevation:* 5,610 to 8,000 feet

*Mean annual precipitation:* 17 to 24 inches

*Frost-free period:* 30 to 50 days

### **Component Description**

#### **Elve and similar soils**

*Composition:* 85 percent

*Geomorphic description:* Mountain slope

*Slope:* 35 to 60 percent, west to southeast aspects

*Elevation:* 5,610 to 8,000 feet

*Effective annual precipitation:* 19 to 25 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Gravelly loam

*Depth to restrictive feature:* None noted

*Drainage class:* Somewhat excessively drained

*Parent material:* Gravelly colluvium

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 4.9 inches

*Typical profile:*

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 11 inches; gravelly loam

Bw—11 to 24 inches; extremely gravelly sandy loam

BC—24 to 60 inches; extremely gravelly loam

### **Additional Components**

Evapo and similar soils: 5 percent

Rock outcrop: 5 percent

Worock and similar soils: 5 percent

## **715G—Worock, dry-Rubick complex, 30 to 70 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Forestland  
*Elevation:* 5,680 to 6,610 feet  
*Mean annual precipitation:* 14 to 17 inches  
*Frost-free period:* 30 to 50 days

### **Component Description**

#### **Worock, dry and similar soils**

*Composition:* 70 percent  
*Geomorphic description:* Mountain slope  
*Slope:* 35 to 70 percent, west to east aspects  
*Elevation:* 5,680 to 6,610 feet  
*Effective annual precipitation:* 17 to 19 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Gravelly loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Colluvium derived from argillite  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 4.8 inches  
*Typical profile:*  
    Oi—0 to 2 inches; slightly decomposed plant material  
    E—2 to 13 inches; gravelly loam  
    E/Bt—13 to 19 inches; very gravelly loam  
    Bt—19 to 33 inches; very gravelly clay loam  
    BC—33 to 60 inches; very channery clay loam

#### **Rubick and similar soils**

*Composition:* 20 percent  
*Geomorphic description:* Mountain slope  
*Slope:* 30 to 60 percent, west to east aspects  
*Elevation:* 5,680 to 6,610 feet  
*Effective annual precipitation:* 17 to 19 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Gravelly loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Somewhat excessively drained  
*Parent material:* Colluvium derived from argillite  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 3.4 inches  
*Typical profile:*  
    Oi—0 to 2 inches; slightly decomposed plant material  
    E1—2 to 7 inches; gravelly loam  
    E2—7 to 12 inches; very cobbly sandy loam  
    Bw—12 to 22 inches; very cobbly sandy loam  
    BC—22 to 60 inches; very channery sandy loam

### **Additional Components**

Danielvil, wet and similar soils: 6 percent

Rock outcrop: 4 percent

## **716G—Tiban-Sigbird-Maurice complex, 35 to 75 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland and forestland

*Elevation:* 5,630 to 7,360 feet

*Mean annual precipitation:* 17 to 19 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Tiban and similar soils**

*Composition:* 60 percent

*Geomorphic description:* Mountain slope

*Slope:* 35 to 75 percent, east to northwest aspects

*Elevation:* 5,630 to 7,370 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very channery loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from argillite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 5.1 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

A—2 to 11 inches; very channery loam

Bw—11 to 22 inches; very channery loam

Bk—22 to 34 inches; very channery loam

BC—34 to 60 inches; very channery loam

#### **Sigbird and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Thinly timbered areas on mountain slope

*Slope:* 35 to 75 percent, east to northwest aspects

*Elevation:* 5,630 to 7,370 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very channery loam

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from argillite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.1 inches

*Typical profile:*

A—0 to 5 inches; very channery loam

Bw—5 to 12 inches; very channery loam



C—12 to 14 inches; extremely channery sandy loam

R—14 to 60 inches; bedrock

**Maurice and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Meadows on mountain slope

*Slope:* 35 to 75 percent, east to northwest aspects

*Elevation:* 5,630 to 7,370 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very channery loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from argillite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.6 inches

*Typical profile:*

A1—0 to 5 inches; very channery loam

A2—5 to 12 inches; very channery loam

Bw—12 to 21 inches; very channery loam

BC—21 to 33 inches; very channery loam

C—33 to 60 inches; very channery loam

**Additional Components**

Rock outcrop: 5 percent

**717E—Libeg-Loberg complex, 8 to 30 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Forestland

*Elevation:* 6,090 to 7,140 feet

*Mean annual precipitation:* 15 to 18 inches

*Frost-free period:* 50 to 70 days

**Component Description**

**Libeg and similar soils**

*Composition:* 45 percent

*Geomorphic description:*

- Summit on mountain
- Shoulder on mountain
- Backslope on mountain

*Slope:* 8 to 30 percent, east to northwest aspects

*Elevation:* 6,090 to 7,140 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Channery loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Gravelly colluvium derived from argillite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 6.1 inches

*Typical profile:*

- Oi—0 to 2 inches; slightly decomposed plant material
- A—2 to 12 inches; channery loam
- Bt—12 to 24 inches; very channery loam
- BC—24 to 60 inches; very channery loam

**Loberg and similar soils**

*Composition:* 40 percent

*Geomorphic description:*

- Backslope on mountain
- Shoulder on mountain
- Summit on mountain

*Slope:* 8 to 30 percent, west to east aspects

*Elevation:* 6,090 to 7,140 feet

*Effective annual precipitation:* 16 to 18 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Gravelly clayey colluvium derived from argillite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 5.7 inches

*Typical profile:*

- Oi—0 to 2 inches; slightly decomposed plant material
- E—2 to 9 inches; gravelly loam
- E/Bt—9 to 14 inches; very cobbly loam
- Bt1—14 to 25 inches; very cobbly clay loam
- Bt2—25 to 44 inches; very stony clay loam
- BC—44 to 60 inches; very channery clay loam

**Additional Components**

Libeg and similar soils: 12 percent

Rock outcrop: 3 percent

**718E—Maurice-Libeg complex, 8 to 30 percent slopes,  
very stony**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,720 to 7,790 feet

*Mean annual precipitation:* 15 to 21 inches

*Frost-free period:* 50 to 70 days

**Component Description**

**Maurice, very stony and similar soils**

*Composition:* 70 percent

*Geomorphic description:* Nose slope backslope on mountain

*Slope:* 8 to 30 percent

*Elevation:* 5,720 to 7,790 feet

*Effective annual precipitation:* 17 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from argillite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.6 inches

*Typical profile:*

A1—0 to 5 inches; gravelly loam

A2—5 to 12 inches; very channery loam

Bw—12 to 21 inches; very channery loam

BC—21 to 33 inches; very channery loam

C—33 to 60 inches; very channery loam

**Libeg, very stony and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Backslope on mountain

*Slope:* 8 to 30 percent

*Elevation:* 5,720 to 7,790 feet

*Effective annual precipitation:* 17 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Channery loam

*Rock fragments on the soil surface:* 0.10 to 1.00 percent stones, 17 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from argillite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 6.4 inches

*Typical profile:*

A—0 to 12 inches; channery loam

Bt—12 to 24 inches; very channery loam

BC—24 to 60 inches; very channery loam

**Additional Components**

Danielvil and similar soils: 5 percent

Sigbird, very stony and similar soils: 5 percent

**719G—Tiban, very stony-Sigbird, very stony-Rubble land complex, 35 to 75 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Forestland

*Elevation:* 5,720 to 7,320 feet

*Mean annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

**Component Description**

**Tiban, very stony and similar soils**

*Composition:* 60 percent

*Geomorphic description:* Mountain slope

*Slope:* 35 to 75 percent, west to east aspects  
*Elevation:* 5,720 to 7,320 feet  
*Effective annual precipitation:* 17 to 19 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Very channery loam  
*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Colluvium derived from argillite  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 5.1 inches  
*Typical profile:*  
    Oi—0 to 2 inches; slightly decomposed plant material  
    A—2 to 11 inches; very channery loam  
    Bw—11 to 22 inches; very channery loam  
    Bk—22 to 34 inches; very channery loam  
    BC—34 to 60 inches; very channery loam

**Sigbird, very stony and similar soils**

*Composition:* 20 percent  
*Geomorphic description:* Thinly timbered areas on mountain slope  
*Slope:* 35 to 65 percent, west to east aspects  
*Elevation:* 5,720 to 7,320 feet  
*Effective annual precipitation:* 17 to 19 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Very channery loam  
*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart  
*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches  
*Drainage class:* Somewhat excessively drained  
*Parent material:* Residuum weathered from argillite  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 1.1 inches  
*Typical profile:*  
    A—0 to 5 inches; very channery loam  
    Bw—5 to 12 inches; very channery loam  
    C—12 to 14 inches; extremely channery sandy loam  
    R—14 to 60 inches; bedrock

**Rubble land**

*Composition:* 15 percent

**Additional Components**

Rock outcrop: 4 percent  
Kilgore and similar soils: 1 percent

**721E—Ratiopeak-Sigbird complex, 15 to 40 percent slopes, very stony**

**Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,690 to 7,180 feet

*Mean annual precipitation:* 14 to 19 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Ratiopeak, very stony and similar soils**

*Composition:* 70 percent

*Geomorphic description:* Backslope on mountain

*Slope:* 15 to 40 percent

*Elevation:* 5,690 to 7,180 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very gravelly loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from argillite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.1 inches

*Typical profile:*

A—0 to 10 inches; very gravelly loam

Bt—10 to 28 inches; very channery clay loam

Bk—28 to 60 inches; very channery sandy loam

#### **Sigbird, very stony and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Backslope on mountain

*Slope:* 15 to 40 percent

*Elevation:* 5,690 to 7,180 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very channery loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from argillite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.1 inches

*Typical profile:*

A—0 to 5 inches; very channery loam

Bw—5 to 12 inches; very channery loam

C—12 to 14 inches; extremely channery sandy loam

R—14 to 60 inches; bedrock

### **Additional Components**

Bullrey, very stony and similar soils: 8 percent

Browns gulch and similar soils: 5 percent

Rock outcrop: 2 percent

## **724E—Winspect gravelly loam, 8 to 30 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,150 to 6,000 feet  
*Mean annual precipitation:* 15 to 18 inches  
*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Winspect and similar soils**

*Composition:* 85 percent  
*Geomorphic description:* Backslope on hill  
*Slope:* 8 to 30 percent, west to southeast aspects  
*Elevation:* 5,150 to 6,000 feet  
*Effective annual precipitation:* 14 to 16 inches  
*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Gravelly loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Calcareous colluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 6.3 inches  
*Typical profile:*  
    A—0 to 5 inches; gravelly loam  
    Ak—5 to 11 inches; cobbly loam  
    Bk1—11 to 20 inches; very cobbly loam  
    Bk2—20 to 60 inches; very cobbly clay loam

### **Additional Components**

Wilspring and similar soils: 12 percent  
Rock outcrop: 3 percent

## **725E—Winspect-Wilspring complex, 8 to 30 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,000 to 5,480 feet  
*Mean annual precipitation:* 12 to 15 inches  
*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Winspect and similar soils**

*Composition:* 65 percent  
*Geomorphic description:* Backslope on hill  
*Slope:* 8 to 30 percent, east to northwest aspects  
*Elevation:* 5,000 to 5,480 feet  
*Effective annual precipitation:* 10 to 14 inches  
*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Very gravelly loam

*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Colluvium derived from limestone  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 6.3 inches  
*Typical profile:*  
A—0 to 5 inches; very gravelly loam  
Ak—5 to 11 inches; cobbly loam  
Bk1—11 to 20 inches; very cobbly loam  
Bk2—20 to 60 inches; very cobbly clay loam

**Wilspring and similar soils**

*Composition:* 20 percent  
*Geomorphic description:*

- Shoulder on hill
- Backslope on hill

*Slope:* 8 to 30 percent, east to northwest aspects  
*Elevation:* 5,000 to 5,480 feet  
*Effective annual precipitation:* 10 to 14 inches  
*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Very channery loam  
*Depth to restrictive feature:* Lithic bedrock: 20 to 40 inches  
*Drainage class:* Well drained  
*Parent material:* Gravelly colluvium over residuum weathered from shale  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 1.9 inches  
*Typical profile:*  
A—0 to 3 inches; very channery loam  
Bw—3 to 7 inches; channery loam  
Bk—7 to 24 inches; very channery loam  
R—24 to 28 inches; unweathered bedrock

**Additional Components**

Windham and similar soils: 8 percent  
Rock outcrop: 7 percent

**726C—Anaconda sandy loam, 0 to 4 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 4,710 to 5,310 feet  
*Mean annual precipitation:* 10 to 14 inches  
*Frost-free period:* 70 to 90 days

**Component Description**

**Anaconda and similar soils**

*Composition:* 85 percent  
*Geomorphic description:*

- Alluvial fan
- Stream terrace

*Slope:* 0 to 4 percent

*Elevation:* 4,710 to 5,310 feet  
*Effective annual precipitation:* 10 to 14 inches  
*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Sandy loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Coarse-loamy alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 7.8 inches  
*Typical profile:*  
A—0 to 8 inches; sandy loam  
Bw—8 to 14 inches; sandy loam  
Bk1—14 to 27 inches; sandy loam  
Bk2—27 to 60 inches; sandy loam

#### **Additional Components**

Con and similar soils: 5 percent  
Gregson and similar soils: 5 percent  
Sixbeacon and similar soils: 5 percent

### **727D—Pappascreek-Monaberg-Mooseflat complex, 2 to 15 percent slopes, stony**

#### **Map Unit Setting**

*Interpretive focus:* Riparian and forestland  
*Elevation:* 5,450 to 6,820 feet  
*Mean annual precipitation:* 15 to 19 inches  
*Frost-free period:* 50 to 70 days

#### **Component Description**

##### **Pappascreek, stony and similar soils**

*Composition:* 45 percent  
*Geomorphic description:* Toeslope on slump  
*Slope:* 2 to 8 percent  
*Elevation:* 5,450 to 6,820 feet  
*Effective annual precipitation:* 15 to 19 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Mucky peat  
*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Somewhat poorly drained  
*Parent material:* Mixed alluvium  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Water table:* Present  
*Available water capacity:* Mainly 7.1 inches  
*Typical profile:*  
Oe—0 to 3 inches; mucky peat  
A—3 to 25 inches; loam  
C—25 to 54 inches; stratified silt loam to loam to coarse sandy loam  
2C—54 to 72 inches; gravelly coarse sand



**Monaberg, stony, wet and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Slump

*Slope:* 4 to 15 percent

*Elevation:* 5,450 to 6,820 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Moderately well drained

*Parent material:* Alluvium

*Native plant cover type:* Forestland

*Flooding:* None

*Water table:* Present

*Available water capacity:* Mainly 8.3 inches

*Typical profile:*

A—0 to 10 inches; loam

Bt—10 to 28 inches; gravelly sandy clay loam

C—28 to 60 inches; gravelly sandy clay loam

**Mooseflat, stony and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Slump drainageway

*Slope:* 2 to 4 percent

*Elevation:* 5,450 to 6,820 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Mucky peat

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Very poorly drained

*Parent material:* Mixed alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Water table:* Present

*Available water capacity:* Mainly 5.1 inches

*Typical profile:*

Oe—0 to 5 inches; mucky peat

A—5 to 14 inches; loam

Bg—14 to 28 inches; sandy clay loam

2Cg—28 to 72 inches; very gravelly coarse sand

**728F—Sebud, very bouldery-Sebud, extremely bouldery  
complex, 20 to 50 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,940 to 7,460 feet

*Mean annual precipitation:* 19 to 21 inches

*Frost-free period:* 30 to 50 days

## Component Description

### **Sebud, very bouldery and similar soils**

*Composition:* 60 percent

*Geomorphic description:* Backslope on south-tending mountain

*Slope:* 20 to 50 percent, east to northwest aspects

*Elevation:* 5,940 to 7,460 feet

*Effective annual precipitation:* 17 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Very cobbly loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent boulders, 20 to 70 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from mixed

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.8 inches

*Typical profile:*

A1—0 to 6 inches; very cobbly loam

A2—6 to 12 inches; very cobbly loam

Bw—12 to 20 inches; very cobbly sandy loam

BC—20 to 30 inches; very cobbly sandy loam

C—30 to 60 inches; very gravelly sandy loam

### **Sebud, extremely bouldery and similar soils**

*Composition:* 30 percent

*Geomorphic description:*

- Backslope on south-tending mountain
- Shoulder on south-tending mountain

*Slope:* 20 to 50 percent, east to northwest aspects

*Elevation:* 5,940 to 7,460 feet

*Effective annual precipitation:* 17 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Very stony loam

*Rock fragments on the soil surface:* 3 to 15 percent boulders, 7 to 20 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from mixed

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.8 inches

*Typical profile:*

A1—0 to 6 inches; very stony loam

A2—6 to 12 inches; very cobbly loam

Bw—12 to 20 inches; very cobbly sandy loam

BC—20 to 30 inches; very cobbly sandy loam

C—30 to 60 inches; very gravelly sandy loam

## Additional Components

Rubick, extremely bouldery and similar soils: 6 percent

Rubble land: 4 percent

## **729E—Maurice, very stony-Sigbird, rubbly-Rock outcrop complex, 8 to 30 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,990 to 7,810 feet

*Mean annual precipitation:* 12 to 19 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Maurice, very stony and similar soils**

*Composition:* 45 percent

*Geomorphic description:* Nose slope backslope on mountain

*Slope:* 15 to 30 percent

*Elevation:* 5,990 to 7,810 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from argillite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 5.6 inches

*Typical profile:*

A1—0 to 5 inches; gravelly loam

A2—5 to 12 inches; very channery loam

Bw—12 to 21 inches; very channery loam

BC—21 to 33 inches; very channery loam

C—33 to 60 inches; very channery loam

#### **Sigbird, rubbly and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Ridge

*Slope:* 8 to 20 percent

*Elevation:* 5,990 to 7,810 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very channery loam

*Rock fragments on the soil surface:* 15 to 30 percent stones, 2 to 3 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from argillite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 1.1 inches

*Typical profile:*

A—0 to 5 inches; very channery loam

Bw—5 to 12 inches; very channery loam

C—12 to 14 inches; extremely channery sandy loam

R—14 to 60 inches; bedrock

**Rock outcrop**

*Composition:* 15 percent

**Additional Components**

Maurice, stony and similar soils: 13 percent

Sigbird, rubbly, very shallow and similar soils: 7 percent

**730E—Maurice, bouldery-Sigbird, very bouldery complex,  
8 to 30 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,560 to 7,690 feet

*Mean annual precipitation:* 14 to 17 inches

*Frost-free period:* 30 to 50 days

**Component Description**

**Maurice, bouldery and similar soils**

*Composition:* 60 percent

*Geomorphic description:* Backslope on mountain

*Slope:* 8 to 30 percent, west to east aspects

*Elevation:* 5,560 to 7,690 feet

*Effective annual precipitation:* 17 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Gravelly loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent boulders, 20 to 70 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Mixed colluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.6 inches

*Typical profile:*

A1—0 to 5 inches; gravelly loam

A2—5 to 12 inches; very channery loam

Bw—12 to 21 inches; very channery loam

BC—21 to 33 inches; very channery loam

C—33 to 60 inches; very channery loam

**Sigbird, very bouldery and similar soils**

*Composition:* 20 percent

*Geomorphic description:*

- Backslope on mountain
- Shoulder on mountain

*Slope:* 8 to 30 percent, west to east aspects

*Elevation:* 5,560 to 7,690 feet

*Effective annual precipitation:* 17 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Very channery loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent boulders, 20 to 70 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Mixed residuum

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.1 inches

*Typical profile:*

A—0 to 5 inches; very channery loam

Bw—5 to 12 inches; very channery loam

C—12 to 14 inches; extremely channery sandy loam

R—14 to 60 inches; bedrock

### **Additional Components**

Maurice, bouldery and similar soils: 10 percent

Ratiopeak, stony and similar soils: 9 percent

Rock outcrop: 1 percent

## **731F—Rubick, stony-Worock complex, 20 to 50 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Forestland

*Elevation:* 5,710 to 7,740 feet

*Mean annual precipitation:* 13 to 15 inches

*Frost-free period:* 30 to 50 days

### **Component Description**

#### **Rubick, stony and similar soils**

*Composition:* 75 percent

*Geomorphic description:* Backslope on north-tending mountain

*Slope:* 20 to 50 percent, northwest to east aspects

*Elevation:* 5,710 to 7,740 feet

*Effective annual precipitation:* 16 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Very gravelly loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Somewhat excessively drained

*Parent material:* Colluvium derived from argillite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 3.4 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

E1—2 to 7 inches; very gravelly loam

E2—7 to 12 inches; very cobbly sandy loam

Bw—12 to 22 inches; very cobbly sandy loam

BC—22 to 60 inches; very channery sandy loam

#### **Worock and similar soils**

*Composition:* 15 percent

*Geomorphic description:*

- Backslope on north-tending mountain
- Footslope on north-tending mountain

*Slope:* 20 to 40 percent, northwest to east aspects

*Elevation:* 5,710 to 7,740 feet

*Effective annual precipitation:* 16 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Gravelly loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from argillite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 4.8 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

E—2 to 13 inches; gravelly loam

E/Bt—13 to 19 inches; very gravelly loam

Bt—19 to 33 inches; very gravelly clay loam

BC—33 to 60 inches; very channery clay loam

### **Additional Components**

Rubick, very stony, greater slopes and similar soils: 5 percent

Sigbird, very stony and similar soils: 4 percent

Rock outcrop: 1 percent

## **732D—Maurice-Mawspring-Sigbird complex, 6 to 20 percent slopes, very stony**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,770 to 7,690 feet

*Mean annual precipitation:* 17 to 19 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Maurice, very stony and similar soils**

*Composition:* 40 percent

*Geomorphic description:* Nose slope backslope on mountain

*Slope:* 6 to 20 percent

*Elevation:* 5,770 to 7,690 feet

*Effective annual precipitation:* 17 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Channery loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from argillite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.6 inches

*Typical profile:*

A1—0 to 5 inches; channery loam

A2—5 to 12 inches; very channery loam

Bw—12 to 21 inches; very channery loam

BC—21 to 33 inches; very channery loam

C—33 to 60 inches; very channery loam

**Mawspring, very stony and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Nose slope footslope on mountain

*Slope:* 6 to 15 percent

*Elevation:* 5,770 to 7,690 feet

*Effective annual precipitation:* 17 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very channery loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Mixed colluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.4 inches

*Typical profile:*

A—0 to 6 inches; very channery loam

Bw—6 to 18 inches; very channery loam

BC—18 to 33 inches; extremely channery sandy loam

C—33 to 60 inches; extremely channery sandy loam

**Sigbird, very stony and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Nose slope on ridge

*Slope:* 6 to 20 percent

*Elevation:* 5,770 to 7,690 feet

*Effective annual precipitation:* 17 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very channery loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from argillite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.1 inches

*Typical profile:*

A—0 to 5 inches; very channery loam

Bw—5 to 12 inches; very channery loam

C—12 to 14 inches; extremely channery sandy loam

R—14 to 60 inches; bedrock

**Additional Components**

Maurice, very stony and similar soils: 7 percent

Rock outcrop: 3 percent

## **734D—Bullrey-Maurice, very stony-Libeg complex, 4 to 15 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 6,430 to 7,690 feet

*Mean annual precipitation:* 19 to 24 inches

*Frost-free period:* 30 to 50 days

### **Component Description**

#### **Bullrey and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Gentle mountain slope

*Slope:* 4 to 12 percent

*Elevation:* 6,430 to 7,690 feet

*Effective annual precipitation:* 19 to 24 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Gravelly loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium and/or colluvium derived from argillite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.4 inches

*Typical profile:*

A1—0 to 7 inches; gravelly loam

A2—7 to 15 inches; very gravelly loam

Bw—15 to 24 inches; very gravelly loam

C—24 to 60 inches; very gravelly sandy loam

#### **Maurice, very stony and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Gentle mountain slope

*Slope:* 8 to 15 percent

*Elevation:* 6,430 to 7,690 feet

*Effective annual precipitation:* 19 to 24 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Channery loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from argillite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.6 inches

*Typical profile:*

A1—0 to 5 inches; channery loam

A2—5 to 12 inches; very channery loam

Bw—12 to 21 inches; very channery loam

BC—21 to 33 inches; very channery loam

C—33 to 60 inches; very channery loam



**Libeg and similar soils**

*Composition:* 25 percent

*Geomorphic description:* Gentle mountain slope

*Slope:* 8 to 15 percent

*Elevation:* 6,430 to 7,690 feet

*Effective annual precipitation:* 19 to 24 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Channery loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Gravelly colluvium derived from argillite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 6.4 inches

*Typical profile:*

A—0 to 12 inches; channery loam

Bt—12 to 24 inches; very channery loam

BC—24 to 60 inches; very channery loam

**Additional Components**

Mawspring, very stony and similar soils: 10 percent

**737D—Libeg-Bridger complex, 6 to 20 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 6,320 to 7,150 feet

*Mean annual precipitation:* 17 to 19 inches

*Frost-free period:* 50 to 70 days

**Component Description**

**Libeg and similar soils**

*Composition:* 70 percent

*Geomorphic description:* Mountain slope

*Slope:* 8 to 20 percent

*Elevation:* 6,320 to 7,150 feet

*Effective annual precipitation:* 17 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Channery loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Mixed colluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 6.4 inches

*Typical profile:*

A—0 to 12 inches; channery loam

Bt—12 to 24 inches; very channery loam

BC—24 to 60 inches; very channery loam

**Bridger and similar soils**

*Composition:* 15 percent

*Geomorphic description:*

- Mountain slope
- Swale

*Slope:* 6 to 12 percent

*Elevation:* 6,320 to 7,150 feet

*Effective annual precipitation:* 17 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Clayey alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 7.9 inches

*Typical profile:*

A1—0 to 3 inches; loam

A2—3 to 9 inches; loam

Bt—9 to 17 inches; clay

Bk—17 to 34 inches; loam

C—34 to 60 inches; sandy loam

**Additional Components**

Redchief and similar soils: 7 percent

Sigbird and similar soils: 6 percent

Rock outcrop: 2 percent

**738E—Rubick-Surdal complex, 15 to 35 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Forestland

*Elevation:* 5,820 to 8,140 feet

*Mean annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

**Component Description**

**Rubick, very stony and similar soils**

*Composition:* 60 percent

*Geomorphic description:* Mountain slope

*Slope:* 15 to 35 percent, northwest to east aspects

*Elevation:* 5,820 to 8,140 feet

*Effective annual precipitation:* 17 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very channery loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Somewhat excessively drained

*Parent material:* Gravelly colluvium derived from argillite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 3.4 inches

*Typical profile:*

- Oi—0 to 2 inches; slightly decomposed plant material
- E1—2 to 7 inches; very channery loam
- E2—7 to 12 inches; very cobbly sandy loam
- Bw—12 to 22 inches; very cobbly sandy loam
- BC—22 to 60 inches; very channery sandy loam

**Surdal, very stony and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Mountain slope

*Slope:* 15 to 30 percent, northwest to east aspects

*Elevation:* 5,820 to 8,140 feet

*Effective annual precipitation:* 17 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very channery loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* Lithic bedrock: 20 to 40 inches

*Drainage class:* Well drained

*Parent material:* Colluvium over residuum weathered from argillite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 1.7 inches

*Typical profile:*

- Oi—0 to 2 inches; slightly decomposed plant material
- A—2 to 7 inches; very channery loam
- Bw—7 to 16 inches; very channery sandy loam
- BC—16 to 28 inches; extremely channery sandy loam
- R—28 to 60 inches; bedrock

**Additional Components**

Ratiopeak, very stony and similar soils: 10 percent

Sigbird, very stony and similar soils: 7 percent

Rock outcrop: 3 percent

**739E—Maurice-Surdal-Mawspring complex, 12 to 35 percent slopes, stony**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,810 to 7,770 feet

*Mean annual precipitation:* 13 to 19 inches

*Frost-free period:* 50 to 70 days

**Component Description**

**Maurice, stony and similar soils**

*Composition:* 45 percent

*Geomorphic description:* Nose slope backslope on mountain

*Slope:* 15 to 35 percent

*Elevation:* 5,810 to 7,780 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very channery loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from argillite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.6 inches

*Typical profile:*

A1—0 to 5 inches; very channery loam

A2—5 to 12 inches; very channery loam

Bw—12 to 21 inches; very channery loam

BC—21 to 33 inches; very channery loam

C—33 to 60 inches; very channery loam

### **Surdal, stony and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Backslope on mountain

*Slope:* 15 to 35 percent

*Elevation:* 5,810 to 7,780 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very channery loam

*Rock fragments on the soil surface:* 0.05 to 0.10 percent stones, 40 to 50 feet apart

*Depth to restrictive feature:* Lithic bedrock: 20 to 40 inches

*Drainage class:* Well drained

*Parent material:* Colluvium over residuum weathered from argillite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.9 inches

*Typical profile:*

A—0 to 7 inches; very channery loam

Bw—7 to 16 inches; very channery sandy loam

BC—16 to 28 inches; extremely channery sandy loam

R—28 to 60 inches; bedrock

### **Mawspring, stony and similar soils**

*Composition:* 15 percent

*Geomorphic description:*

- Mountain slope
- Swale

*Slope:* 12 to 25 percent

*Elevation:* 5,810 to 7,780 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very channery loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from argillite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.4 inches

*Typical profile:*

A—0 to 6 inches; very channery loam

Bw—6 to 18 inches; very channery loam

BC—18 to 33 inches; extremely channery sandy loam

C—33 to 60 inches; extremely channery sandy loam

### **Additional Components**

Sigbird, very stony and similar soils: 14 percent

Rock outcrop: 6 percent

## **740F—Tiban-Sigbird complex, 20 to 50 percent slopes, very stony**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,530 to 7,590 feet

*Mean annual precipitation:* 16 to 18 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Tiban, very stony and similar soils**

*Composition:* 60 percent

*Geomorphic description:* South-tending mountain slope

*Slope:* 20 to 50 percent, east to northwest aspects

*Elevation:* 5,530 to 7,600 feet

*Effective annual precipitation:* 13 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very channery loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from argillite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.4 inches

*Typical profile:*

A—0 to 11 inches; very channery loam

Bw—11 to 22 inches; very channery loam

Bk—22 to 34 inches; very channery loam

BC—34 to 60 inches; very channery loam

#### **Sigbird, very stony and similar soils**

*Composition:* 15 percent

*Geomorphic description:*

- South-tending mountain
- Ridge

*Slope:* 20 to 45 percent, east to northwest aspects

*Elevation:* 5,530 to 7,600 feet

*Effective annual precipitation:* 13 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very channery loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from argillite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.1 inches

*Typical profile:*

A—0 to 5 inches; very channery loam

Bw—5 to 12 inches; very channery loam

C—12 to 14 inches; extremely channery sandy loam

R—14 to 60 inches; bedrock

### **Additional Components**

Maurice, stony and similar soils: 8 percent

Rock outcrop: 7 percent

Sigbird, extremely stony, very shallow and similar soils: 5 percent

Surdal, stony and similar soils: 5 percent

## **741F—Maurice-Sigbird-Surdal complex, 20 to 50 percent slopes, stony**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,280 to 8,370 feet

*Mean annual precipitation:* 13 to 17 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Maurice, stony and similar soils**

*Composition:* 50 percent

*Geomorphic description:* North-tending mountain slope

*Slope:* 30 to 50 percent, west to southeast aspects

*Elevation:* 5,280 to 8,370 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Channery loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from argillite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.6 inches

*Typical profile:*

A1—0 to 5 inches; channery loam

A2—5 to 12 inches; very channery loam

Bw—12 to 21 inches; very channery loam

BC—21 to 33 inches; very channery loam

C—33 to 60 inches; very channery loam

#### **Sigbird, stony and similar soils**

*Composition:* 20 percent

*Geomorphic description:*

- North-tending mountain
- Ridge

*Slope:* 20 to 45 percent, west to southeast aspects

*Elevation:* 5,280 to 8,370 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very channery loam

*Rock fragments on the soil surface:* 0.01 to 0.50 percent stones, 27 to 100 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from argillite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.1 inches

*Typical profile:*

A—0 to 5 inches; very channery loam

Bw—5 to 12 inches; very channery loam

C—12 to 14 inches; extremely channery sandy loam

R—14 to 60 inches; bedrock

### **Surdal, stony and similar soils**

*Composition:* 20 percent

*Geomorphic description:* North-tending mountain slope

*Slope:* 20 to 50 percent, west to southeast aspects

*Elevation:* 5,280 to 8,370 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very channery loam

*Rock fragments on the soil surface:* 0.05 to 0.10 percent stones, 40 to 50 feet apart

*Depth to restrictive feature:* Lithic bedrock: 20 to 40 inches

*Drainage class:* Well drained

*Parent material:* Colluvium over residuum weathered from argillite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.9 inches

*Typical profile:*

A—0 to 7 inches; very channery loam

Bw—7 to 16 inches; very channery sandy loam

BC—16 to 28 inches; extremely channery sandy loam

R—28 to 60 inches; bedrock

### **Additional Components**

Tiban, very stony and similar soils: 6 percent

Rock outcrop: 4 percent

## **742F—Trimad, very stony-Frenchcreek, very stony-Rubble land complex, 25 to 60 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,360 to 7,150 feet

*Mean annual precipitation:* 15 to 19 inches

*Frost-free period:* 70 to 90 days

## Component Description

### **Trimad, very stony and similar soils**

*Composition:* 40 percent

*Geomorphic description:* Backslope on south-tending mountain

*Slope:* 35 to 60 percent, east to west aspects

*Elevation:* 5,360 to 7,150 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Very channery loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Calcareous colluvium derived from quartzite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.1 inches

*Typical profile:*

A—0 to 3 inches; very channery loam

Bw—3 to 7 inches; gravelly loam

Bk1—7 to 12 inches; gravelly loam

Bk2—12 to 26 inches; very gravelly loam

Bk3—26 to 60 inches; extremely gravelly sandy loam

### **Frenchcreek, very stony and similar soils**

*Composition:* 20 percent

*Geomorphic description:*

- Shoulder on south-tending mountain
- Backslope on south-tending mountain

*Slope:* 25 to 50 percent, east to west aspects

*Elevation:* 5,360 to 7,150 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Very gravelly loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from quartzite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 2.8 inches

*Typical profile:*

A—0 to 5 inches; very gravelly loam

Bw1—5 to 12 inches; very gravelly loam

Bw2—12 to 26 inches; extremely gravelly sandy loam

C1—26 to 36 inches; very gravelly loamy sand

C2—36 to 60 inches; extremely gravelly sandy loam

### **Rubble land**

*Composition:* 17 percent

### **Rock outcrop**

*Composition:* 15 percent



### **Additional Components**

Sixbeacon, very stony and similar soils: 8 percent

## **744E—Sigbird, very shallow-Sigbird-Surdal complex, 8 to 25 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 6,090 to 7,090 feet

*Mean annual precipitation:* 14 to 18 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Sigbird, very shallow and similar soils**

*Composition:* 30 percent

*Geomorphic description:*

- Summit on hill
- Shoulder on hill

*Slope:* 8 to 20 percent

*Elevation:* 6,090 to 7,090 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Extremely channery loam

*Depth to restrictive feature:* Lithic bedrock: 5 to 10 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from argillite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 0.6 inches

*Typical profile:*

A—0 to 3 inches; extremely channery loam

Bw—3 to 8 inches; extremely channery loam

R—8 to 60 inches; bedrock

#### **Sigbird and similar soils**

*Composition:* 25 percent

*Geomorphic description:*

- Backslope on hill
- Summit on hill

*Slope:* 8 to 25 percent

*Elevation:* 6,090 to 7,090 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very channery loam

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from argillite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.1 inches

*Typical profile:*

- A—0 to 5 inches; very channery loam
- Bw—5 to 12 inches; very channery loam
- C—12 to 14 inches; extremely channery sandy loam
- R—14 to 60 inches; bedrock

**Surdal and similar soils**

- Composition:* 25 percent
- Geomorphic description:* Backslope on hill
- Slope:* 12 to 25 percent
- Elevation:* 6,090 to 7,090 feet
- Effective annual precipitation:* 15 to 17 inches
- Frost-free period:* 50 to 70 days
- Surface layer texture:* Very channery loam
- Depth to restrictive feature:* Lithic bedrock: 20 to 40 inches
- Drainage class:* Well drained
- Parent material:* Colluvium over residuum weathered from argillite
- Native plant cover type:* Rangeland
- Flooding:* None
- Available water capacity:* Mainly 1.9 inches
- Typical profile:*
  - A—0 to 7 inches; very channery loam
  - Bw—7 to 16 inches; very channery sandy loam
  - BC—16 to 28 inches; extremely channery sandy loam
  - R—28 to 60 inches; bedrock

**Additional Components**

- Maurice and similar soils: 10 percent
- Rock outcrop: 8 percent
- Kilgore and similar soils: 2 percent

**747F—Rubick-Surdal complex, 30 to 70 percent slopes,  
very stony**

**Map Unit Setting**

- Interpretive focus:* Forestland and rangeland
- Elevation:* 5,280 to 7,630 feet
- Mean annual precipitation:* 12 to 15 inches
- Frost-free period:* 50 to 70 days

**Component Description**

**Rubick, very stony and similar soils**

- Composition:* 60 percent
- Geomorphic description:* Backslope on north-tending mountain
- Slope:* 30 to 70 percent, west to southeast aspects
- Elevation:* 5,280 to 7,630 feet
- Effective annual precipitation:* 15 to 17 inches
- Frost-free period:* 50 to 70 days
- Surface layer texture:* Very channery loam
- Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 40 to 100 feet apart
- Depth to restrictive feature:* None noted
- Drainage class:* Somewhat excessively drained

*Parent material:* Gravelly colluvium

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 3.4 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

E1—2 to 7 inches; very channery loam

E2—7 to 12 inches; very cobbly sandy loam

Bw—12 to 22 inches; very cobbly sandy loam

BC—22 to 60 inches; very channery sandy loam

### **Surdal, very stony and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Backslope on north-tending mountain

*Slope:* 30 to 70 percent, west to southeast aspects

*Elevation:* 5,280 to 7,630 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very channery loam

*Rock fragments on the soil surface:* 0.10 to 5.00 percent stones, 27 to 83 feet apart

*Depth to restrictive feature:* Lithic bedrock: 20 to 40 inches

*Drainage class:* Well drained

*Parent material:* Colluvium over residuum weathered from argillite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.9 inches

*Typical profile:*

A—0 to 7 inches; very channery loam

Bw—7 to 16 inches; very channery sandy loam

BC—16 to 28 inches; extremely channery sandy loam

R—28 to 60 inches; bedrock

### **Additional Components**

Mawspring, very stony and similar soils: 6 percent

Rock outcrop: 6 percent

Rubble land: 4 percent

Sigbird, very stony and similar soils: 4 percent

## **749E—Surdal-Mawspring, bouldery complex, 8 to 25 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,720 to 6,970 feet

*Mean annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Surdal and similar soils**

*Composition:* 60 percent

*Geomorphic description:* Backslope on south-tending hill

*Slope:* 12 to 25 percent, east to northwest aspects

*Elevation:* 5,720 to 6,970 feet  
*Effective annual precipitation:* 14 to 16 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Sand  
*Depth to restrictive feature:* Lithic bedrock: 20 to 40 inches  
*Drainage class:* Well drained  
*Parent material:* Colluvium over residuum weathered from sandstone  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 1.9 inches  
*Typical profile:*  
A—0 to 7 inches; sand  
Bw—7 to 16 inches; very channery sandy loam  
BC—16 to 28 inches; extremely channery sandy loam  
R—28 to 60 inches; bedrock

**Mawspring, bouldery and similar soils**

*Composition:* 30 percent  
*Geomorphic description:* Footslope on south-tending hill  
*Slope:* 8 to 25 percent, east to northwest aspects  
*Elevation:* 5,720 to 6,970 feet  
*Effective annual precipitation:* 14 to 16 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Cobbly loamy sand  
*Rock fragments on the soil surface:* 0.01 to 0.10 percent boulders, 17 to 100 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Colluvium derived from sandstone  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 3.4 inches  
*Typical profile:*  
A—0 to 6 inches; cobbly loamy sand  
Bw—6 to 18 inches; very channery loam  
BC—18 to 33 inches; extremely channery sandy loam  
C—33 to 60 inches; extremely channery sandy loam

**Additional Components**

Sigbird, bouldery and similar soils: 6 percent  
Surdal, very bouldery and similar soils: 3 percent  
Rock outcrop: 1 percent

**750F—Poin, extremely stony-Hungryhill, very stony complex, 20 to 50 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,790 to 7,170 feet  
*Mean annual precipitation:* 16 to 19 inches  
*Frost-free period:* 50 to 70 days

### Component Description

#### **Poin, extremely stony and similar soils**

*Composition:* 45 percent

*Geomorphic description:* Side slope on south-tending hill

*Slope:* 20 to 50 percent, east to northwest aspects

*Elevation:* 5,790 to 7,170 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very cobbly sandy loam

*Rock fragments on the soil surface:* 3 to 15 percent stones, 2 to 8 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Well drained

*Parent material:* Residuum weathered from sandstone

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.0 inches

*Typical profile:*

A—0 to 5 inches; very cobbly sandy loam

Bw—5 to 12 inches; very cobbly loam

C—12 to 15 inches; extremely cobbly sandy loam

R—15 to 60 inches; bedrock

#### **Hungryhill, very stony and similar soils**

*Composition:* 40 percent

*Geomorphic description:*

- Base slope on south-tending hill
- Head slope on south-tending hill

*Slope:* 20 to 50 percent, east to northwest aspects

*Elevation:* 5,790 to 7,170 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very gravelly loamy fine sand

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* Lithic bedrock: 20 to 40 inches

*Drainage class:* Well drained

*Parent material:* Loamy skeletal colluvium over sandstone

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.2 inches

*Typical profile:*

A1—0 to 4 inches; very gravelly loamy fine sand

A2—4 to 11 inches; gravelly loam

Bt—11 to 20 inches; very gravelly sandy clay loam

BC—20 to 31 inches; very gravelly sandy loam

R—31 to 60 inches; bedrock

### Additional Components

Poin, extremely stony, very shallow and similar soils: 10 percent

Rock outcrop: 5 percent

## **751F—Sigbird-Tiban-Maurice complex, 20 to 50 percent slopes, very stony**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,360 to 6,530 feet

*Mean annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Sigbird, very stony and similar soils**

*Composition:* 30 percent

*Geomorphic description:*

- South-tending mountain
- Ridge

*Slope:* 20 to 45 percent, east to northwest aspects

*Elevation:* 5,360 to 6,530 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very channery sandy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from quartzite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.1 inches

*Typical profile:*

- A—0 to 5 inches; very channery sandy loam
- Bw—5 to 12 inches; very channery loam
- C—12 to 14 inches; extremely channery sandy loam
- R—14 to 60 inches; bedrock

#### **Tiban, very stony and similar soils**

*Composition:* 25 percent

*Geomorphic description:* South-tending mountain slope

*Slope:* 20 to 50 percent, east to northwest aspects

*Elevation:* 5,360 to 6,530 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very channery fine sandy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Mixed colluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.4 inches

*Typical profile:*

- A—0 to 11 inches; very channery fine sandy loam
- Bw—11 to 22 inches; very channery loam
- Bk—22 to 34 inches; very channery loam
- BC—34 to 60 inches; very channery loam

**Maurice, very stony and similar soils**

*Composition:* 20 percent

*Geomorphic description:* North-tending mountain slope

*Slope:* 20 to 50 percent, west to southeast aspects

*Elevation:* 5,360 to 6,530 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very channery fine sandy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Mixed colluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.6 inches

*Typical profile:*

A1—0 to 5 inches; very channery fine sandy loam

A2—5 to 12 inches; very channery loam

Bw—12 to 21 inches; very channery loam

BC—21 to 33 inches; very channery loam

C—33 to 60 inches; very channery loam

**Additional Components**

Sigbird, extremely stony, very shallow and similar soils: 13 percent

Surdal, very stony and similar soils: 10 percent

Rock outcrop: 2 percent

**756D—Passcreek-Poin, stony complex, 6 to 20 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,200 to 9,000 feet

*Mean annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

**Component Description**

**Passcreek and similar soils**

*Composition:* 60 percent

*Geomorphic description:* Backslope on hill

*Slope:* 6 to 20 percent

*Elevation:* 5,500 to 9,000 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Channery fine sandy loam

*Depth to restrictive feature:* Lithic bedrock: 20 to 40 inches

*Drainage class:* Well drained

*Parent material:* Residuum weathered from sandstone

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.5 inches

*Typical profile:*

- A—0 to 7 inches; channery fine sandy loam
- Bt—7 to 14 inches; clay loam
- Bk1—14 to 21 inches; gravelly clay loam
- Bk2—21 to 38 inches; very gravelly loam
- R—38 to 60 inches; bedrock

**Poin, stony and similar soils**

*Composition:* 25 percent

*Geomorphic description:*

- Shoulder on hill
- Summit on hill

*Slope:* 6 to 20 percent

*Elevation:* 5,200 to 5,990 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very cobbly sandy loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Well drained

*Parent material:* Residuum weathered from sandstone

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.1 inches

*Typical profile:*

- A—0 to 5 inches; very cobbly sandy loam
- Bw—5 to 13 inches; very cobbly sandy loam
- C—13 to 15 inches; very cobbly coarse sandy loam
- R—15 to 60 inches; bedrock

**Additional Components**

Browns gulch and similar soils: 13 percent

Rock outcrop: 2 percent

**757F—Surdal-Sigbird-Mawspring complex, 15 to 60 percent slopes, very stony**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 6,270 to 6,940 feet

*Mean annual precipitation:* 17 to 19 inches

*Frost-free period:* 50 to 70 days

**Component Description**

**Surdal, very stony and similar soils**

*Composition:* 45 percent

*Geomorphic description:* Backslope on southeast tending mountain slope

*Slope:* 25 to 60 percent, east to west aspects

*Elevation:* 6,270 to 6,940 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very channery sandy loam



*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* Lithic bedrock: 20 to 40 inches

*Drainage class:* Well drained

*Parent material:* Colluvium over residuum weathered from sandstone

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.9 inches

*Typical profile:*

A—0 to 7 inches; very channery sandy loam

Bw—7 to 16 inches; very channery sandy loam

BC—16 to 28 inches; extremely channery sandy loam

R—28 to 60 inches; bedrock

### **Sigbird, very stony and similar soils**

*Composition:* 25 percent

*Geomorphic description:* Backslope on southeast tending mountain

*Slope:* 25 to 60 percent, east to west aspects

*Elevation:* 6,270 to 6,940 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very channery sandy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Somewhat excessively drained

*Parent material:* Residuum weathered from sandstone

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.1 inches

*Typical profile:*

A—0 to 5 inches; very channery sandy loam

Bw—5 to 12 inches; very channery loam

C—12 to 14 inches; extremely channery sandy loam

R—14 to 60 inches; bedrock

### **Mawspring, very stony and similar soils**

*Composition:* 15 percent

*Geomorphic description:*

- Footslope on southeast-tending mountain
- Backslope on southeast-tending mountain

*Slope:* 15 to 45 percent, east to west aspects

*Elevation:* 6,270 to 6,940 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very channery sandy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from sandstone

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.4 inches

*Typical profile:*

A—0 to 6 inches; very channery sandy loam

Bw—6 to 18 inches; very channery loam

BC—18 to 33 inches; extremely channery sandy loam

C—33 to 60 inches; extremely channery sandy loam

### **Additional Components**

Rock outcrop: 10 percent

Sigbird, extremely stony, very shallow and similar soils: 5 percent

## **761E—Quincreek, very stony-Whitlash, very stony-Rock outcrop complex, 12 to 35 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,280 to 6,630 feet

*Mean annual precipitation:* 12 to 16 inches

*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Quincreek, very stony and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Backslope on southeast-tending hill

*Slope:* 15 to 30 percent, east to northwest aspects

*Elevation:* 5,280 to 6,630 feet

*Effective annual precipitation:* 10 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Gravelly loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* Lithic bedrock: 20 to 40 inches

*Drainage class:* Well drained

*Parent material:* Gravelly residuum weathered from limestone

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 2.9 inches

*Typical profile:*

A—0 to 3 inches; gravelly loam

Bt—3 to 9 inches; channery clay loam

Bk1—9 to 19 inches; very channery loam

Bk2—19 to 27 inches; very channery loam

R—27 to 60 inches; unweathered bedrock

#### **Whitlash, very stony and similar soils**

*Composition:* 25 percent

*Geomorphic description:* Backslope on southeast-tending hill

*Slope:* 15 to 35 percent, east to northwest aspects

*Elevation:* 5,280 to 6,630 feet

*Effective annual precipitation:* 10 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Very gravelly sandy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Well drained

*Parent material:* Residuum weathered from sandstone

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.1 inches

*Typical profile:*

A—0 to 4 inches; very gravelly sandy loam

Bw—4 to 12 inches; very gravelly sandy loam

BC—12 to 15 inches; very gravelly sandy loam

R—15 to 60 inches; bedrock

**Rock outcrop**

*Composition:* 20 percent

**Bronec, very stony and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Southeast-tending swales on hill

*Slope:* 12 to 20 percent, east to northwest aspects

*Elevation:* 5,280 to 6,630 feet

*Effective annual precipitation:* 10 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Very gravelly loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Sandy and gravelly alluvium derived from limestone

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.8 inches

*Typical profile:*

A—0 to 9 inches; very gravelly loam

Bk—9 to 48 inches; very gravelly loam

BC—48 to 60 inches; very gravelly loamy sand

**Additional Components**

Reedpoint, very stony and similar soils: 10 percent

**801F—Skaggs, extremely stony-Skaggs, very stony-Rock outcrop complex, 20 to 60 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,610 to 6,760 feet

*Mean annual precipitation:* 12 to 17 inches

*Frost-free period:* 50 to 70 days

**Component Description**

**Skaggs, extremely stony and similar soils**

*Composition:* 40 percent

*Geomorphic description:* Backslope on hill

*Slope:* 20 to 60 percent

*Elevation:* 5,610 to 6,760 feet

*Effective annual precipitation:* 13 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very gravelly loam

*Rock fragments on the soil surface:* 3 to 15 percent stones, 2 to 7 feet apart

*Depth to restrictive feature:* Lithic bedrock: 20 to 40 inches

*Drainage class:* Well drained

*Parent material:* Residuum weathered from limestone

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.7 inches

*Typical profile:*

A—0 to 8 inches; very gravelly loam

Bk1—8 to 18 inches; gravelly loam

Bk2—18 to 29 inches; very gravelly loam

R—29 to 60 inches; bedrock

### **Skaggs, very stony and similar soils**

*Composition:* 30 percent

*Geomorphic description:*

- Footslope on hill
- Backslope on hill

*Slope:* 20 to 50 percent

*Elevation:* 5,610 to 6,760 feet

*Effective annual precipitation:* 13 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* Lithic bedrock: 20 to 40 inches

*Drainage class:* Well drained

*Parent material:* Residuum weathered from limestone

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.7 inches

*Typical profile:*

A—0 to 8 inches; gravelly loam

Bk1—8 to 18 inches; gravelly loam

Bk2—18 to 29 inches; very gravelly loam

R—29 to 60 inches; bedrock

### **Rock outcrop**

*Composition:* 20 percent

### **Additional Components**

Starley, rubbly and similar soils: 10 percent

## **802E—Starley-Tropal complex, 12 to 40 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,350 to 7,090 feet

*Mean annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

### Component Description

#### **Starley and similar soils**

*Composition:* 50 percent

*Geomorphic description:* Backslope on south-tending hill

*Slope:* 15 to 40 percent, east to northwest aspects

*Elevation:* 5,350 to 7,090 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very gravelly loam

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Well drained

*Parent material:* Residuum weathered from limestone

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.3 inches

*Typical profile:*

A—0 to 7 inches; very gravelly loam

Bk—7 to 14 inches; very gravelly loam

R—14 to 60 inches; bedrock

#### **Tropal and similar soils**

*Composition:* 30 percent

*Geomorphic description:*

- Summit on south-tending hill
- Shoulder on south-tending hill

*Slope:* 12 to 30 percent, east to northwest aspects

*Elevation:* 5,350 to 7,090 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very gravelly loam

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Well drained

*Parent material:* Residuum weathered from limestone

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.1 inches

*Typical profile:*

A—0 to 4 inches; very gravelly loam

Bk—4 to 12 inches; very gravelly loam

R—12 to 60 inches; bedrock

### Additional Components

Rock outcrop: 10 percent

Skaggs and similar soils: 10 percent

## **803E—Sieben very cobbly loam, 12 to 30 percent slopes, stony**

### Map Unit Setting

*Interpretive focus:* Rangeland

*Elevation:* 5,310 to 6,300 feet

*Mean annual precipitation:* 11 to 13 inches

*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Sieben, stony and similar soils**

*Composition:* 80 percent

*Geomorphic description:* Eroded fan remnant

*Slope:* 12 to 30 percent

*Elevation:* 5,310 to 6,300 feet

*Effective annual precipitation:* 11 to 13 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Very cobbly loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium derived from limestone

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 4.2 inches

*Typical profile:*

A—0 to 5 inches; very cobbly loam

Bt—5 to 12 inches; very gravelly sandy clay loam

Bk1—12 to 25 inches; very gravelly sandy loam

Bk2—25 to 60 inches; very gravelly sandy loam

### **Additional Components**

Sieben, lesser slopes and similar soils: 9 percent

Sixbeacon, stony and similar soils: 8 percent

Rivra, stony and similar soils: 3 percent

## **805C—Sixbeacon, stony-Bronec complex, 2 to 8 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,400 to 5,690 feet

*Mean annual precipitation:* 11 to 13 inches

*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Sixbeacon, stony and similar soils**

*Composition:* 70 percent

*Geomorphic description:* Fan remnant

*Slope:* 2 to 8 percent, south to west aspects

*Elevation:* 5,400 to 5,690 feet

*Effective annual precipitation:* 11 to 13 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Cobbly loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium derived from limestone

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 4.9 inches

*Typical profile:*

A—0 to 6 inches; cobbly loam

Bw—6 to 12 inches; very cobbly loam

Bk1—12 to 35 inches; very gravelly loam

Bk2—35 to 60 inches; very gravelly sandy loam

**Bronec and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Fan remnant

*Slope:* 4 to 8 percent, south to west aspects

*Elevation:* 5,400 to 5,690 feet

*Effective annual precipitation:* 11 to 13 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Very cobbly loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Sandy and gravelly alluvium derived from limestone

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.8 inches

*Typical profile:*

A—0 to 5 inches; very cobbly loam

Bk—5 to 35 inches; very gravelly loam

BC—35 to 60 inches; very gravelly sandy loam

**Additional Components**

Kalsted and similar soils: 10 percent

**806D—Sieben very cobbly loam, 4 to 12 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,250 to 5,990 feet

*Mean annual precipitation:* 11 to 13 inches

*Frost-free period:* 70 to 90 days

**Component Description**

**Sieben and similar soils**

*Composition:* 85 percent

*Geomorphic description:* Fan remnant

*Slope:* 4 to 12 percent, south to west aspects

*Elevation:* 5,250 to 5,990 feet

*Effective annual precipitation:* 11 to 13 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Very cobbly loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium derived from limestone

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 4.2 inches

*Typical profile:*

A—0 to 5 inches; very cobbly loam

Bt—5 to 12 inches; very gravelly sandy clay loam

Bk1—12 to 25 inches; very gravelly sandy loam

Bk2—25 to 60 inches; very gravelly sandy loam

### **Additional Components**

Sixbeacon, stony and similar soils: 8 percent

Sieben, stony, greater slopes and similar soils: 5 percent

Rivra, stony and similar soils: 2 percent

## **807E—Pensore, stony-Roto complex, 8 to 30 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,300 to 6,590 feet

*Mean annual precipitation:* 12 to 15 inches

*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Pensore, stony and similar soils**

*Composition:* 50 percent

*Geomorphic description:*

- Backslope on south-tending hill
- Shoulder on south-tending hill
- Summit on south-tending hill

*Slope:* 12 to 30 percent, east to northwest aspects

*Elevation:* 5,300 to 6,590 feet

*Effective annual precipitation:* 11 to 13 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Very gravelly loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Well drained

*Parent material:* Gravelly residuum weathered from limestone

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.6 inches

*Typical profile:*

A—0 to 7 inches; very gravelly loam

Bk—7 to 17 inches; very gravelly loam

R—17 to 60 inches; unweathered bedrock

#### **Roto and similar soils**

*Composition:* 40 percent

*Geomorphic description:* Footslope on south-tending hill

*Slope:* 8 to 20 percent, east to northwest aspects

*Elevation:* 5,300 to 6,590 feet

*Effective annual precipitation:* 11 to 13 inches

*Frost-free period:* 70 to 90 days



*Surface layer texture:* Very gravelly loam

*Depth to restrictive feature:* Lithic bedrock: 20 to 40 inches

*Drainage class:* Well drained

*Parent material:* Alluvium and/or colluvium over residuum weathered from limestone

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.0 inches

*Typical profile:*

A—0 to 4 inches; very gravelly loam

Bk1—4 to 12 inches; very gravelly loam

Bk2—12 to 19 inches; very gravelly loam

Bk3—19 to 35 inches; very gravelly loam

R—35 to 60 inches; unweathered bedrock

### **Additional Components**

Pensore, stony, greater slopes and similar soils: 8 percent

Rock outcrop, limestone: 2 percent

## **808F—Pensore, stony-Rock outcrop complex, 20 to 45 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,460 to 6,630 feet

*Mean annual precipitation:* 14 to 16 inches

*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Pensore, stony and similar soils**

*Composition:* 65 percent

*Geomorphic description:*

- Summit on south-tending hill
- Shoulder on south-tending hill
- Backslope on south-tending hill

*Slope:* 20 to 45 percent, east to northwest aspects

*Elevation:* 5,460 to 6,630 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Extremely gravelly loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Well drained

*Parent material:* Gravelly residuum weathered from limestone

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 0.8 inches

*Typical profile:*

A—0 to 7 inches; extremely gravelly loam

Bk—7 to 14 inches; extremely gravelly loam

R—14 to 60 inches; unweathered bedrock

**Rock outcrop**

*Composition:* 20 percent

**Additional Components**

Pensore, stony, lesser slopes and similar soils: 10 percent

Roto and similar soils: 5 percent

**809G—Pensore, stony-Rock outcrop complex, 45 to 70 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,360 to 6,820 feet

*Mean annual precipitation:* 12 to 16 inches

*Frost-free period:* 70 to 90 days

**Component Description**

**Pensore, stony and similar soils**

*Composition:* 50 percent

*Geomorphic description:*

- Summit on south-tending hill
- Shoulder on south-tending hill
- Backslope on south-tending hill

*Slope:* 45 to 70 percent, east to northwest aspects

*Elevation:* 5,360 to 6,820 feet

*Effective annual precipitation:* 10 to 12 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Extremely gravelly loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Well drained

*Parent material:* Residuum over fractured limestone

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 0.8 inches

*Typical profile:*

- A—0 to 7 inches; extremely gravelly loam
- Bk—7 to 14 inches; extremely gravelly loam
- R—14 to 60 inches; unweathered bedrock

**Rock outcrop**

*Composition:* 25 percent

**Additional Components**

Pensore, stony, lesser slopes and similar soils: 10 percent

Roto and similar soils: 10 percent

## **810F—Whitore, very stony-Skaggs-very stony-Rock outcrop complex, 20 to 50 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,280 to 6,890 feet  
*Mean annual precipitation:* 15 to 18 inches  
*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Whitore, very stony and similar soils**

*Composition:* 40 percent  
*Geomorphic description:* Backslope on south-tending hill  
*Slope:* 20 to 50 percent, east to northwest aspects  
*Elevation:* 5,280 to 6,890 feet  
*Effective annual precipitation:* 13 to 16 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Very gravelly loam  
*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Colluvium derived from limestone  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 5.6 inches  
*Typical profile:*  
    A—0 to 5 inches; very gravelly loam  
    E—5 to 8 inches; gravelly loam  
    Bw—8 to 14 inches; very gravelly loam  
    Bk1—14 to 21 inches; very gravelly loam  
    Bk2—21 to 60 inches; very gravelly loam

#### **Skaggs, very stony and similar soils**

*Composition:* 25 percent  
*Geomorphic description:* Backslope on south-tending hill  
*Slope:* 20 to 50 percent, east to northwest aspects  
*Elevation:* 5,280 to 6,890 feet  
*Effective annual precipitation:* 13 to 16 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Very gravelly loam  
*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart  
*Depth to restrictive feature:* Lithic bedrock: 20 to 40 inches  
*Drainage class:* Well drained  
*Parent material:* Colluvium over residuum weathered from limestone  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 3.7 inches  
*Typical profile:*  
    A—0 to 8 inches; very gravelly loam  
    Bk1—8 to 18 inches; gravelly loam  
    Bk2—18 to 29 inches; very gravelly loam  
    R—29 to 60 inches; bedrock

**Rock outcrop**

*Composition:* 15 percent

**Additional Components**

Starley, very stony and similar soils: 10 percent

Whitore, stony, lesser slopes and similar soils: 10 percent

**811G—Whitore-Skaggs complex, 40 to 70 percent slopes,  
very stony**

**Map Unit Setting**

*Interpretive focus:* Forestland and rangeland

*Elevation:* 5,640 to 7,250 feet

*Mean annual precipitation:* 10 to 13 inches

*Frost-free period:* 50 to 70 days

**Component Description**

**Whitore, very stony and similar soils**

*Composition:* 55 percent

*Geomorphic description:* Backslope on north-tending mountain

*Slope:* 40 to 70 percent, west to southeast aspects

*Elevation:* 5,640 to 7,250 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very cobbly loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from limestone

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 5.6 inches

*Typical profile:*

A—0 to 5 inches; very cobbly loam

E—5 to 8 inches; gravelly loam

Bw—8 to 14 inches; very gravelly loam

Bk1—14 to 21 inches; very gravelly loam

Bk2—21 to 60 inches; very gravelly loam

**Skaggs, very stony and similar soils**

*Composition:* 25 percent

*Geomorphic description:* Backslope on north-tending mountain

*Slope:* 40 to 70 percent, west to southeast aspects

*Elevation:* 5,640 to 7,250 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very gravelly loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* Lithic bedrock: 20 to 40 inches

*Drainage class:* Well drained

*Parent material:* Colluvium over residuum weathered from limestone

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.7 inches

*Typical profile:*

A—0 to 8 inches; very gravelly loam

Bk1—8 to 18 inches; gravelly loam

Bk2—18 to 29 inches; very gravelly loam

R—29 to 60 inches; bedrock

### **Additional Components**

Rock outcrop: 10 percent

Whitore, rubbly and similar soils: 10 percent

## **812F—Whitore, moist-Skaggs complex, 20 to 50 percent slopes, very stony**

### **Map Unit Setting**

*Interpretive focus:* Forestland and rangeland

*Elevation:* 5,460 to 7,330 feet

*Mean annual precipitation:* 15 to 18 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Whitore, very stony, moist and similar soils**

*Composition:* 60 percent

*Geomorphic description:* Backslope on south-tending hill

*Slope:* 20 to 50 percent, east to northwest aspects

*Elevation:* 5,460 to 7,330 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very gravelly loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from limestone

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 5.6 inches

*Typical profile:*

A—0 to 5 inches; very gravelly loam

E—5 to 8 inches; gravelly loam

Bw—8 to 14 inches; very gravelly loam

Bk1—14 to 21 inches; very gravelly loam

Bk2—21 to 60 inches; very gravelly loam

#### **Skaggs, very stony and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Backslope on south-tending hill

*Slope:* 20 to 50 percent, east to northwest aspects

*Elevation:* 5,460 to 7,330 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very gravelly loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* Lithic bedrock: 20 to 40 inches

*Drainage class:* Well drained

*Parent material:* Colluvium over residuum weathered from limestone

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.7 inches

*Typical profile:*

A—0 to 8 inches; very gravelly loam

Bk1—8 to 18 inches; gravelly loam

Bk2—18 to 29 inches; very gravelly loam

R—29 to 60 inches; bedrock

### **Additional Components**

Whitore, stony, lesser slopes and similar soils: 10 percent

Rock outcrop: 5 percent

Starley, very stony and similar soils: 5 percent

## **813F—Whitore, stony-Whitore complex, 20 to 60 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Forestland

*Elevation:* 5,490 to 7,140 feet

*Mean annual precipitation:* 13 to 15 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Whitore, stony and similar soils**

*Composition:* 60 percent

*Geomorphic description:* Backslope on north-tending mountain

*Slope:* 30 to 60 percent, west to southeast aspects

*Elevation:* 5,500 to 7,140 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very gravelly loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from limestone

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 5.6 inches

*Typical profile:*

A—0 to 5 inches; very gravelly loam

E—5 to 8 inches; gravelly loam

Bw—8 to 14 inches; very gravelly loam

Bk1—14 to 21 inches; very gravelly loam

Bk2—21 to 60 inches; very gravelly loam

#### **Whitore and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Head slope on north-tending mountain

*Slope:* 20 to 50 percent, west to southeast aspects

*Elevation:* 5,500 to 7,140 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very gravelly loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from limestone

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 5.6 inches

*Typical profile:*

A—0 to 5 inches; very gravelly loam

E—5 to 8 inches; gravelly loam

Bw—8 to 14 inches; very gravelly loam

Bk1—14 to 21 inches; very gravelly loam

Bk2—21 to 60 inches; very gravelly loam

### **Additional Components**

Whitore, lesser slopes and similar soils: 10 percent

Skaggs, very stony, open woodland and similar soils: 6 percent

Rock outcrop: 4 percent

## **814E—Whitore complex, 12 to 45 percent slopes, stony**

### **Map Unit Setting**

*Interpretive focus:* Forestland

*Elevation:* 5,560 to 7,250 feet

*Mean annual precipitation:* 13 to 17 inches

*Frost-free period:* 40 to 70 days

### **Component Description**

#### **Whitore, stony and similar soils**

*Composition:* 60 percent

*Geomorphic description:* Backslope on north-tending mountain

*Slope:* 15 to 45 percent, west to southeast aspects

*Elevation:* 5,560 to 7,250 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 40 to 70 days

*Surface layer texture:* Very gravelly loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from limestone

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 5.6 inches

*Typical profile:*

A—0 to 5 inches; very gravelly loam

E—5 to 8 inches; gravelly loam

Bw—8 to 14 inches; very gravelly loam

Bk1—14 to 21 inches; very gravelly loam

Bk2—21 to 60 inches; very gravelly loam

**Whitore, stony, gravelly loam and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Head slope footslope on north-tending mountain

*Slope:* 12 to 30 percent, west to southeast aspects

*Elevation:* 5,560 to 7,250 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 40 to 70 days

*Surface layer texture:* Gravelly loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from limestone

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 5.6 inches

*Typical profile:*

A—0 to 5 inches; gravelly loam

E—5 to 8 inches; gravelly loam

Bw—8 to 14 inches; very gravelly loam

Bk1—14 to 21 inches; very gravelly loam

Bk2—21 to 60 inches; very gravelly loam

**Additional Components**

Tropal, very stony and similar soils: 8 percent

Tropal, very stony, greater slopes and similar soils: 2 percent

**816G—Whitore, very stony-Tropal, very stony-Rock  
outcrop complex, 45 to 80 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Forestland

*Elevation:* 5,490 to 7,220 feet

*Mean annual precipitation:* 12 to 16 inches

*Frost-free period:* 50 to 70 days

**Component Description**

**Whitore, very stony and similar soils**

*Composition:* 50 percent

*Geomorphic description:* Backslope on north-tending mountain

*Slope:* 45 to 65 percent, west to southeast aspects

*Elevation:* 5,500 to 7,220 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very gravelly loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from limestone

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 5.6 inches



*Typical profile:*

- A—0 to 5 inches; very gravelly loam
- E—5 to 8 inches; gravelly loam
- Bw—8 to 14 inches; very gravelly loam
- Bk1—14 to 21 inches; very gravelly loam
- Bk2—21 to 60 inches; very gravelly loam

**Tropal, very stony and similar soils**

*Composition:* 20 percent

*Geomorphic description:*

- Nose slope shoulder on north-tending mountain
- Nose slope summit on north-tending mountain

*Slope:* 50 to 80 percent, west to southeast aspects

*Elevation:* 5,500 to 7,220 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very gravelly loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Well drained

*Parent material:* Residuum weathered from limestone

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 1.1 inches

*Typical profile:*

- A—0 to 4 inches; very gravelly loam
- Bk—4 to 12 inches; very gravelly loam
- R—12 to 60 inches; bedrock

**Rock outcrop**

*Composition:* 15 percent

**Additional Components**

Whitore, stony and similar soils: 10 percent

Skaggs, very stony and similar soils: 5 percent

**817E—Whitore, very stony-Raynesford complex, 15 to 40 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,630 to 7,270 feet

*Mean annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

**Component Description**

**Whitore, very stony and similar soils**

*Composition:* 60 percent

*Geomorphic description:* Backslope on mountain

*Slope:* 15 to 40 percent

*Elevation:* 5,630 to 7,270 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very gravelly loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from limestone

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.6 inches

*Typical profile:*

A—0 to 5 inches; very gravelly loam

E—5 to 8 inches; gravelly loam

Bw—8 to 14 inches; very gravelly loam

Bk1—14 to 21 inches; very gravelly loam

Bk2—21 to 60 inches; very gravelly loam

### **Raynesford and similar soils**

*Composition:* 25 percent

*Geomorphic description:*

- Backslope on mountain
- Footslope on mountain

*Slope:* 15 to 30 percent

*Elevation:* 5,630 to 7,270 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Calcareous loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 9.6 inches

*Typical profile:*

A1—0 to 5 inches; gravelly loam

A2—5 to 10 inches; gravelly loam

Bk1—10 to 23 inches; gravelly loam

Bk2—23 to 60 inches; gravelly silt loam

### **Additional Components**

Tropal, very stony and similar soils: 13 percent

Rock outcrop: 2 percent

## **818D—Raynesford-Whitore, very stony complex, 4 to 20 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,970 to 6,950 feet

*Mean annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

## Component Description

### **Raynesford and similar soils**

*Composition:* 50 percent

*Geomorphic description:* Basin floor

*Slope:* 4 to 15 percent

*Elevation:* 5,970 to 6,960 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Calcareous loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 9.6 inches

*Typical profile:*

A1—0 to 5 inches; gravelly loam

A2—5 to 10 inches; gravelly loam

Bk1—10 to 23 inches; gravelly loam

Bk2—23 to 60 inches; gravelly silt loam

### **Whitore, very stony and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Low hill

*Slope:* 8 to 20 percent

*Elevation:* 5,970 to 6,960 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very gravelly loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from limestone

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.6 inches

*Typical profile:*

A—0 to 5 inches; very gravelly loam

E—5 to 8 inches; gravelly loam

Bw—8 to 14 inches; very gravelly loam

Bk1—14 to 21 inches; very gravelly loam

Bk2—21 to 60 inches; very gravelly loam

## Additional Components

Tropal, very stony and similar soils: 14 percent

Rock outcrop: 1 percent

## **819D—Raynesford-Whitore complex, 4 to 15 percent slopes, stony**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,540 to 6,970 feet

*Mean annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Raynesford, stony and similar soils**

*Composition:* 55 percent

*Geomorphic description:* Fan remnant

*Slope:* 4 to 8 percent

*Elevation:* 5,540 to 6,970 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Rock fragments on the soil surface:* 0.01 to 0.12 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Calcareous loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 9.6 inches

*Typical profile:*

A1—0 to 5 inches; loam

A2—5 to 10 inches; gravelly loam

Bk1—10 to 23 inches; gravelly loam

Bk2—23 to 60 inches; gravelly silt loam

#### **Whitore, stony and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Fan remnant

*Slope:* 8 to 15 percent

*Elevation:* 5,540 to 6,970 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly loam

*Rock fragments on the soil surface:* 0.01 to 0.12 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Gravelly alluvium derived from limestone

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.6 inches

*Typical profile:*

A—0 to 5 inches; gravelly loam

E—5 to 8 inches; gravelly loam

Bw—8 to 14 inches; very gravelly loam

Bk1—14 to 21 inches; very gravelly loam

Bk2—21 to 60 inches; very gravelly loam

### **Additional Components**

Whitore, very stony and similar soils: 10 percent

## **820E—Whitore, stony-Tropal, very stony-Raynesford, stony complex, 12 to 45 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Forestland and rangeland

*Elevation:* 5,630 to 7,270 feet

*Mean annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Whitore, stony and similar soils**

*Composition:* 60 percent

*Geomorphic description:* Backslope on mountain

*Slope:* 15 to 40 percent, west to southeast aspects

*Elevation:* 5,630 to 7,270 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very gravelly loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from limestone

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 5.6 inches

*Typical profile:*

A—0 to 5 inches; very gravelly loam

E—5 to 8 inches; gravelly loam

Bw—8 to 14 inches; very gravelly loam

Bk1—14 to 21 inches; very gravelly loam

Bk2—21 to 60 inches; very gravelly loam

#### **Tropal, very stony and similar soils**

*Composition:* 20 percent

*Geomorphic description:*

- Nose slope shoulder on mountain
- Nose slope summit on mountain

*Slope:* 12 to 45 percent, west to southeast aspects

*Elevation:* 5,630 to 7,270 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very gravelly loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Well drained

*Parent material:* Residuum weathered from limestone

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.1 inches

*Typical profile:*

- A—0 to 4 inches; very gravelly loam
- Bk—4 to 12 inches; very gravelly loam
- R—12 to 60 inches; bedrock

**Raynesford, stony and similar soils**

*Composition:* 18 percent

*Geomorphic description:*

- Backslope on mountain
- Footslope on mountain

*Slope:* 15 to 35 percent, west to southeast aspects

*Elevation:* 5,630 to 7,270 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Calcareous loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 9.6 inches

*Typical profile:*

- A1—0 to 5 inches; gravelly loam
- A2—5 to 10 inches; gravelly loam
- Bk1—10 to 23 inches; gravelly loam
- Bk2—23 to 60 inches; gravelly silt loam

**Additional Components**

Rock outcrop: 2 percent

**823E—Skaggs-Raynesford-Tropal, very stony complex,  
8 to 35 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland and forestland

*Elevation:* 5,630 to 7,270 feet

*Mean annual precipitation:* 14 to 18 inches

*Frost-free period:* 50 to 70 days

**Component Description**

**Skaggs and similar soils**

*Composition:* 45 percent

*Geomorphic description:* Backslope on hill

*Slope:* 15 to 35 percent

*Elevation:* 6,690 to 7,050 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly loam

*Depth to restrictive feature:* Lithic bedrock: 20 to 40 inches

*Drainage class:* Well drained

*Parent material:* Colluvium over residuum weathered from limestone

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.7 inches

*Typical profile:*

A—0 to 8 inches; gravelly loam

Bk1—8 to 18 inches; gravelly loam

Bk2—18 to 29 inches; very gravelly loam

R—29 to 60 inches; bedrock

**Raynesford and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Foothill on hill

*Slope:* 8 to 30 percent

*Elevation:* 6,690 to 7,050 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Calcareous loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 9.6 inches

*Typical profile:*

A1—0 to 5 inches; loam

A2—5 to 10 inches; gravelly loam

Bk1—10 to 23 inches; gravelly loam

Bk2—23 to 60 inches; gravelly silt loam

**Tropal, very stony and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Forested ridge

*Slope:* 15 to 35 percent

*Elevation:* 6,690 to 7,050 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very gravelly loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Well drained

*Parent material:* Residuum weathered from limestone

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 1.1 inches

*Typical profile:*

A—0 to 4 inches; very gravelly loam

Bk—4 to 12 inches; very gravelly loam

R—12 to 60 inches; bedrock

**Additional Components**

Rock outcrop: 5 percent

## **825E—Skaggs-Whitore complex, 12 to 35 percent slopes, stony**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 6,640 to 7,230 feet

*Mean annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Skaggs, stony and similar soils**

*Composition:* 50 percent

*Geomorphic description:* Backslope on south-tending hill

*Slope:* 12 to 35 percent, east to west aspects

*Elevation:* 6,640 to 7,230 feet

*Effective annual precipitation:* 13 to 15 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very gravelly loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* Lithic bedrock: 20 to 40 inches

*Drainage class:* Well drained

*Parent material:* Colluvium over residuum weathered from limestone

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.7 inches

*Typical profile:*

A—0 to 8 inches; very gravelly loam

Bk1—8 to 18 inches; gravelly loam

Bk2—18 to 29 inches; very gravelly loam

R—29 to 60 inches; bedrock

#### **Whitore, stony and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Backslope on south-tending hill

*Slope:* 12 to 30 percent, east to west aspects

*Elevation:* 6,640 to 7,230 feet

*Effective annual precipitation:* 13 to 15 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very gravelly loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from limestone

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.6 inches

*Typical profile:*

A—0 to 5 inches; very gravelly loam

E—5 to 8 inches; gravelly loam

Bw—8 to 14 inches; very gravelly loam

Bk1—14 to 21 inches; very gravelly loam

Bk2—21 to 60 inches; very gravelly loam



### **Additional Components**

Starley, very stony and similar soils: 14 percent  
Rock outcrop: 1 percent

## **826E—Raynesford-Whitore-Skaggs complex, 12 to 30 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 6,660 to 7,040 feet  
*Mean annual precipitation:* 14 to 16 inches  
*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Raynesford and similar soils**

*Composition:* 45 percent  
*Geomorphic description:* Head slope backslope on north-tending hill  
*Slope:* 12 to 25 percent, west to east aspects  
*Elevation:* 6,660 to 7,040 feet  
*Effective annual precipitation:* 15 to 17 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Calcareous loamy slope alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 9.6 inches  
*Typical profile:*  
    A1—0 to 5 inches; loam  
    A2—5 to 10 inches; gravelly loam  
    Bk1—10 to 23 inches; gravelly loam  
    Bk2—23 to 60 inches; gravelly silt loam

#### **Whitore and similar soils**

*Composition:* 30 percent  
*Geomorphic description:* Backslope on north-tending hill  
*Slope:* 12 to 30 percent, west to east aspects  
*Elevation:* 6,660 to 7,040 feet  
*Effective annual precipitation:* 15 to 17 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Gravelly loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Colluvium derived from limestone  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 5.6 inches  
*Typical profile:*  
    A—0 to 5 inches; gravelly loam  
    E—5 to 8 inches; gravelly loam  
    Bw—8 to 14 inches; very gravelly loam

Bk1—14 to 21 inches; very gravelly loam

Bk2—21 to 60 inches; very gravelly loam

**Skaggs and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Nose slope backslope on north-tending hill

*Slope:* 12 to 30 percent, west to east aspects

*Elevation:* 6,660 to 7,040 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly loam

*Depth to restrictive feature:* Lithic bedrock: 20 to 40 inches

*Drainage class:* Well drained

*Parent material:* Colluvium over residuum weathered from limestone

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 3.7 inches

*Typical profile:*

A—0 to 8 inches; gravelly loam

Bk1—8 to 18 inches; gravelly loam

Bk2—18 to 29 inches; very gravelly loam

R—29 to 60 inches; bedrock

**Additional Components**

Starley and similar soils: 5 percent

**830D—Kalsted gravelly sandy loam, 8 to 15 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 4,800 to 6,100 feet

*Mean annual precipitation:* 10 to 14 inches

*Frost-free period:* 90 to 105 days

**Component Description**

**Kalsted and similar soils**

*Composition:* 85 percent

*Geomorphic description:* Fan remnant

*Slope:* 8 to 15 percent

*Elevation:* 4,800 to 6,100 feet

*Effective annual precipitation:* 10 to 14 inches

*Frost-free period:* 90 to 105 days

*Surface layer texture:* Gravelly sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 6.9 inches

*Typical profile:*

A—0 to 3 inches; gravelly sandy loam

Bk1—3 to 22 inches; sandy loam

Bk2—22 to 52 inches; gravelly sandy loam

BC—52 to 60 inches; stratified gravelly sandy loam to loamy sand

### **Additional Components**

Kalsted, loamy sand and similar soils: 8 percent

Scravo and similar soils: 5 percent

Amesha and similar soils: 1 percent

Rock outcrop: 1 percent

## **901E—Sebud-Poin-Tiban complex, 15 to 45 percent slopes, extremely stony**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,380 to 7,860 feet

*Mean annual precipitation:* 14 to 18 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Sebud, extremely stony and similar soils**

*Composition:* 40 percent

*Geomorphic description:*

- Backslope on mountain
- Footslope on mountain

*Slope:* 15 to 40 percent

*Elevation:* 5,380 to 7,860 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very cobbly loam

*Rock fragments on the soil surface:* 3 to 15 percent stones, 3 to 10 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from quartzite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 4.9 inches

*Typical profile:*

A1—0 to 4 inches; very cobbly loam

A2—4 to 10 inches; very cobbly loam

Bw—10 to 38 inches; very cobbly sandy loam

BC—38 to 60 inches; very cobbly sandy loam

#### **Poin, extremely stony and similar soils**

*Composition:* 35 percent

*Geomorphic description:*

- Nose slope shoulder on mountain
- Nose slope backslope on mountain

*Slope:* 30 to 45 percent

*Elevation:* 5,380 to 7,860 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very cobbly sandy loam

*Rock fragments on the soil surface:* 3 to 15 percent stones, 2 to 8 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Well drained

*Parent material:* Residuum weathered from quartzite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.0 inches

*Typical profile:*

A—0 to 5 inches; very cobbly sandy loam

Bw—5 to 12 inches; very cobbly loam

C—12 to 15 inches; extremely cobbly sandy loam

R—15 to 60 inches; bedrock

**Tiban, extremely stony and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Backslope on mountain

*Slope:* 30 to 45 percent

*Elevation:* 5,380 to 7,860 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very cobbly loam

*Rock fragments on the soil surface:* 3 to 15 percent stones, 2 to 8 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Calcareous colluvium derived from quartzite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.6 inches

*Typical profile:*

A—0 to 8 inches; very cobbly loam

Bw—8 to 16 inches; very cobbly loam

Bk—16 to 60 inches; very gravelly loam

**Additional Components**

Libeg, extremely stony and similar soils: 4 percent

Rock outcrop: 1 percent

**904D—Sebud, stony-Redchief complex, 8 to 25 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 6,040 to 7,180 feet

*Mean annual precipitation:* 19 to 23 inches

*Frost-free period:* 50 to 70 days

**Component Description**

**Sebud, stony and similar soils**

*Composition:* 65 percent

*Geomorphic description:* Slump

*Slope:* 8 to 25 percent

*Elevation:* 6,040 to 7,180 feet

*Effective annual precipitation:* 19 to 23 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very cobbly loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from quartzite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 4.9 inches

*Typical profile:*

A1—0 to 4 inches; very cobbly loam

A2—4 to 10 inches; very cobbly loam

Bw—10 to 38 inches; very cobbly sandy loam

BC—38 to 60 inches; very cobbly sandy loam

#### **Redchief and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Slump

*Slope:* 8 to 25 percent

*Elevation:* 6,040 to 7,180 feet

*Effective annual precipitation:* 19 to 23 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from quartzite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 7.1 inches

*Typical profile:*

A1—0 to 5 inches; gravelly loam

A2—5 to 12 inches; very gravelly loam

Bt1—12 to 21 inches; very cobbly clay loam

Bt2—21 to 60 inches; very gravelly clay loam

#### **Additional Components**

Foxgulch and similar soils: 10 percent

Sebud, stony and similar soils: 5 percent

### **905E—Tigeron, stony-Rubick, very stony complex, 15 to 45 percent slopes**

#### **Map Unit Setting**

*Interpretive focus:* Forestland

*Elevation:* 5,720 to 7,860 feet

*Mean annual precipitation:* 14 to 20 inches

*Frost-free period:* 50 to 70 days

#### **Component Description**

##### **Tigeron, stony and similar soils**

*Composition:* 50 percent

*Geomorphic description:* Backslope on mountain

*Slope:* 15 to 35 percent

*Elevation:* 5,720 to 7,860 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very cobbly sandy loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from quartzite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 4.3 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

E1—2 to 7 inches; very cobbly sandy loam

E2—7 to 13 inches; very cobbly sandy loam

E and Bt—13 to 18 inches; very cobbly sandy loam

Bt—18 to 34 inches; very cobbly sandy clay loam

BC—34 to 60 inches; very gravelly sandy loam

#### **Rubick, very stony and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Backslope on mountain

*Slope:* 15 to 45 percent

*Elevation:* 5,720 to 7,860 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very cobbly sandy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Somewhat excessively drained

*Parent material:* Colluvium derived from quartzite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 2.7 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

A—2 to 3 inches; very cobbly sandy loam

E1—3 to 8 inches; very cobbly sandy loam

E2—8 to 13 inches; very cobbly sandy loam

Bw—13 to 27 inches; very cobbly sandy loam

BC—27 to 60 inches; extremely stony loamy sand

#### **Additional Components**

Tiban, very stony and similar soils: 10 percent

Silas and similar soils: 5 percent

### **906E—Rubick, very stony-Tigeron, stony complex, 15 to 45 percent slopes**

#### **Map Unit Setting**

*Interpretive focus:* Forestland

*Elevation:* 5,950 to 7,410 feet

*Mean annual precipitation:* 14 to 17 inches

*Frost-free period:* 30 to 50 days

### **Component Description**

#### **Rubick, very stony and similar soils**

*Composition:* 55 percent

*Geomorphic description:* Backslope on mountain

*Slope:* 15 to 45 percent, west to southeast aspects

*Elevation:* 5,950 to 7,410 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Very gravelly sandy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Somewhat excessively drained

*Parent material:* Colluvium derived from quartzite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 2.7 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

A—2 to 3 inches; very gravelly sandy loam

E1—3 to 8 inches; very cobbly sandy loam

E2—8 to 13 inches; very cobbly sandy loam

Bw—13 to 27 inches; very cobbly sandy loam

BC—27 to 60 inches; extremely stony loamy sand

#### **Tigeron, stony and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Backslope on mountain

*Slope:* 15 to 35 percent, west to southeast aspects

*Elevation:* 5,950 to 7,410 feet

*Effective annual precipitation:* 15 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Gravelly loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from quartzite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 4.3 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

E1—2 to 7 inches; gravelly loam

E2—7 to 13 inches; very cobbly sandy loam

E and Bt—13 to 18 inches; very cobbly sandy loam

Bt—18 to 34 inches; very cobbly sandy clay loam

BC—34 to 60 inches; very gravelly sandy loam

### **Additional Components**

Rock outcrop: 5 percent

Silas, stony and similar soils: 5 percent

## **907F—Sebud, extremely stony-Rubick, very stony complex, 25 to 60 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Rangeland and forestland

*Elevation:* 5,580 to 7,760 feet

*Mean annual precipitation:* 16 to 19 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Sebud, extremely stony and similar soils**

*Composition:* 55 percent

*Geomorphic description:* Backslope on mountain

*Slope:* 25 to 55 percent, east to northwest aspects

*Elevation:* 5,580 to 7,760 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very cobbly loam

*Rock fragments on the soil surface:* 3 to 15 percent stones, 2 to 7 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from quartzite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 4.9 inches

*Typical profile:*

A1—0 to 4 inches; very cobbly loam

A2—4 to 10 inches; very cobbly loam

Bw—10 to 38 inches; very cobbly sandy loam

BC—38 to 60 inches; very cobbly sandy loam

#### **Rubick and similar soils**

*Composition:* 25 percent

*Geomorphic description:* Backslope on south-tending forested mountain

*Slope:* 25 to 60 percent, east to west aspects

*Elevation:* 5,580 to 7,760 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very gravelly sandy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Somewhat excessively drained

*Parent material:* Colluvium derived from quartzite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 2.7 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

A—2 to 3 inches; very gravelly sandy loam

E1—3 to 8 inches; very cobbly sandy loam

E2—8 to 13 inches; very cobbly sandy loam

Bw—13 to 27 inches; very cobbly sandy loam

BC—27 to 60 inches; extremely stony loamy sand



### **Additional Components**

Poin, extremely stony and similar soils: 10 percent  
Rock outcrop: 5 percent  
Rubble land: 5 percent

## **908E—Sebud-Tiban-Ratiopeak complex, 12 to 30 percent slopes, stony**

### **Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 5,560 to 7,580 feet  
*Mean annual precipitation:* 15 to 18 inches  
*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Sebud, stony and similar soils**

*Composition:* 40 percent  
*Geomorphic description:* Backslope on south-tending mountain  
*Slope:* 15 to 30 percent, east to northwest aspects  
*Elevation:* 5,560 to 7,580 feet  
*Effective annual precipitation:* 15 to 17 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Very cobbly loam  
*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Colluvium derived from quartzite  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 4.9 inches  
*Typical profile:*  
    A1—0 to 4 inches; very cobbly loam  
    A2—4 to 10 inches; very cobbly loam  
    Bw—10 to 38 inches; very cobbly sandy loam  
    BC—38 to 60 inches; very cobbly sandy loam

#### **Tiban, stony and similar soils**

*Composition:* 25 percent  
*Geomorphic description:* Backslope on south-tending mountain  
*Slope:* 15 to 30 percent, east to northwest aspects  
*Elevation:* 5,560 to 7,580 feet  
*Effective annual precipitation:* 15 to 17 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Very cobbly loam  
*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Calcareous colluvium derived from quartzite  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 5.6 inches

*Typical profile:*

- A—0 to 8 inches; very cobbly loam
- Bw—8 to 16 inches; very cobbly loam
- Bk—16 to 60 inches; very gravelly loam

**Ratiopeak, stony and similar soils**

*Composition:* 20 percent

*Geomorphic description:*

- Footslope on south-tending mountain
- Backslope on south-tending mountain

*Slope:* 12 to 25 percent, east to northwest aspects

*Elevation:* 5,560 to 7,580 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very cobbly loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium and/or colluvium derived from quartzite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.8 inches

*Typical profile:*

- A1—0 to 4 inches; very cobbly loam
- A2—4 to 10 inches; very cobbly loam
- Bt1—10 to 14 inches; very cobbly loam
- Bt2—14 to 26 inches; very cobbly sandy clay loam
- Bk—26 to 60 inches; very cobbly sandy loam

**Additional Components**

Sebud, very stony, greater slopes and similar soils: 9 percent

Poin, very stony and similar soils: 5 percent

Rock outcrop: 1 percent

**909G—Rubick, rubbly-Rubble land complex, 40 to 75 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Watershed (forestland-scrree)

*Elevation:* 5,300 to 8,300 feet

*Mean annual precipitation:* 13 to 19 inches

*Frost-free period:* 50 to 70 days

**Component Description**

**Rubick, rubbly and similar soils**

*Composition:* 50 percent

*Geomorphic description:* Backslope on mountain

*Slope:* 40 to 75 percent

*Elevation:* 5,300 to 8,300 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very cobbly sandy loam

*Rock fragments on the soil surface:* 15 to 50 percent stones, 2 to 3 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Somewhat excessively drained

*Parent material:* Colluvium derived from quartzite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 2.7 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

A—2 to 3 inches; very cobbly sandy loam

E1—3 to 8 inches; very cobbly sandy loam

E2—8 to 13 inches; very cobbly sandy loam

Bw—13 to 27 inches; very cobbly sandy loam

BC—27 to 60 inches; extremely stony loamy sand

#### **Rubble land**

*Composition:* 25 percent

#### **Additional Components**

Poin, rubbly and similar soils: 10 percent

Sebud, extremely stony and similar soils: 10 percent

Rock outcrop: 5 percent

### **910F—Sebud-Ratiopeak complex, 20 to 50 percent slopes, very stony**

#### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,310 to 7,810 feet

*Mean annual precipitation:* 17 to 19 inches

*Frost-free period:* 50 to 70 days

#### **Component Description**

##### **Sebud, very stony and similar soils**

*Composition:* 55 percent

*Geomorphic description:* Backslope on south-tending mountain

*Slope:* 30 to 50 percent, east to northwest aspects

*Elevation:* 5,310 to 7,810 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very cobbly loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from quartzite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 4.9 inches

*Typical profile:*

A1—0 to 4 inches; very cobbly loam

A2—4 to 10 inches; very cobbly loam

Bw—10 to 38 inches; very cobbly sandy loam

BC—38 to 60 inches; very cobbly sandy loam

**Ratiopeak, very stony and similar soils**

*Composition:* 30 percent

*Geomorphic description:*

- Backslope on south-tending mountain
- Foothlope on south-tending mountain

*Slope:* 20 to 40 percent, east to northwest aspects

*Elevation:* 5,310 to 7,810 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very cobbly loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium and/or colluvium derived from quartzite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.8 inches

*Typical profile:*

A1—0 to 4 inches; very cobbly loam

A2—4 to 10 inches; very cobbly loam

Bt1—10 to 14 inches; very cobbly loam

Bt2—14 to 26 inches; very cobbly sandy clay loam

Bk—26 to 60 inches; very cobbly sandy loam

**Additional Components**

Poin, extremely stony and similar soils: 9 percent

Tiban, very stony and similar soils: 5 percent

Rock outcrop: 1 percent

**911E—Sebud, stony-Adel complex, 12 to 30 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,820 to 7,510 feet

*Mean annual precipitation:* 16 to 20 inches

*Frost-free period:* 30 to 50 days

**Component Description**

**Sebud, stony and similar soils**

*Composition:* 65 percent

*Geomorphic description:* Backslope on south-tending mountain

*Slope:* 15 to 30 percent

*Elevation:* 5,820 to 7,510 feet

*Effective annual precipitation:* 17 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Very cobbly loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from quartzite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 4.9 inches

*Typical profile:*

A1—0 to 4 inches; very cobbly loam

A2—4 to 10 inches; very cobbly loam

Bw—10 to 38 inches; very cobbly sandy loam

BC—38 to 60 inches; very cobbly sandy loam

**Adel and similar soils**

*Composition:* 20 percent

*Geomorphic description:*

- Backslope on south-tending mountain
- Swale

*Slope:* 12 to 25 percent

*Elevation:* 5,820 to 7,510 feet

*Effective annual precipitation:* 17 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Gravelly loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 9.6 inches

*Typical profile:*

A1—0 to 8 inches; gravelly loam

A2—8 to 24 inches; silt loam

A3—24 to 33 inches; silt loam

Bw1—33 to 45 inches; silty clay loam

Bw2—45 to 60 inches; clay loam

**Additional Components**

Sebud, very stony and similar soils: 10 percent

Ratiopeak, stony and similar soils: 5 percent

**912D—Ratiopeak-Redchief complex, 4 to 15 percent slopes, stony**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 6,280 to 7,320 feet

*Mean annual precipitation:* 19 to 24 inches

*Frost-free period:* 30 to 50 days

**Component Description**

**Ratiopeak, stony and similar soils**

*Composition:* 60 percent

*Geomorphic description:* Gentle mountain slope

*Slope:* 4 to 15 percent

*Elevation:* 6,280 to 7,320 feet

*Effective annual precipitation:* 19 to 24 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Very cobbly loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium derived from quartzite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.8 inches

*Typical profile:*

A1—0 to 4 inches; very cobbly loam

A2—4 to 10 inches; very cobbly loam

Bt1—10 to 14 inches; very cobbly loam

Bt2—14 to 26 inches; very cobbly sandy clay loam

Bk—26 to 60 inches; very cobbly sandy loam

### **Redchief, stony and similar soils**

*Composition:* 25 percent

*Geomorphic description:* Gentle mountain slope

*Slope:* 4 to 12 percent

*Elevation:* 6,280 to 7,320 feet

*Effective annual precipitation:* 19 to 24 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Cobbly loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium derived from quartzite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 7.1 inches

*Typical profile:*

A1—0 to 5 inches; cobbly loam

A2—5 to 12 inches; very gravelly loam

Bt1—12 to 21 inches; very cobbly clay loam

Bt2—21 to 60 inches; very gravelly clay loam

### **Additional Components**

Monaberg, stony and similar soils: 10 percent

Sebud, very stony and similar soils: 5 percent

## **913E—Rubick gravelly sandy loam, 8 to 30 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Forestland

*Elevation:* 5,660 to 7,430 feet

*Mean annual precipitation:* 18 to 22 inches

*Frost-free period:* 30 to 50 days

### **Component Description**

#### **Rubick and similar soils**

*Composition:* 85 percent

*Geomorphic description:* Backslope on mountain

*Slope:* 8 to 30 percent, west to east aspects

*Elevation:* 5,660 to 7,430 feet  
*Effective annual precipitation:* 19 to 24 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Gravelly sandy loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Somewhat excessively drained  
*Parent material:* Colluvium derived from quartzite  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 2.7 inches  
*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material  
A—2 to 3 inches; gravelly sandy loam  
E1—3 to 8 inches; very cobbly sandy loam  
E2—8 to 13 inches; very cobbly sandy loam  
Bw—13 to 27 inches; very cobbly sandy loam  
BC—27 to 60 inches; extremely stony loamy sand

#### **Additional Components**

Tigeron and similar soils: 10 percent  
*Rubick, greater slopes and similar soils:* 5 percent

### **920G—Poin, rubbly-Rubble land-Rock outcrop complex, 40 to 80 percent slopes**

#### **Map Unit Setting**

*Interpretive focus:* Watershed and wildlife  
*Elevation:* 5,270 to 7,270 feet  
*Mean annual precipitation:* 14 to 16 inches  
*Frost-free period:* 50 to 80 days

#### **Component Description**

##### **Poin, rubbly and similar soils**

*Composition:* 35 percent  
*Geomorphic description:*

- Shoulder on mountain
- Backslope on mountain

*Slope:* 40 to 80 percent  
*Elevation:* 5,270 to 7,270 feet  
*Effective annual precipitation:* 10 to 14 inches  
*Frost-free period:* 50 to 80 days  
*Surface layer texture:* Extremely cobbly sandy loam  
*Rock fragments on the soil surface:* 15 to 75 percent stones, 0 to 3 feet apart  
*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches  
*Drainage class:* Well drained  
*Parent material:* Residuum  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 1.0 inches  
*Typical profile:*

A—0 to 5 inches; extremely cobbly sandy loam  
Bw—5 to 12 inches; very cobbly loam

C—12 to 15 inches; extremely cobbly sandy loam

R—15 to 60 inches; bedrock

**Rubble land**

*Composition:* 30 percent

**Rock outcrop**

*Composition:* 20 percent

**Additional Components**

Poin, rubbly, very shallow and similar soils: 10 percent

Sebud, extremely stony and similar soils: 5 percent

**921F—Whitlash-Frenchcreek complex, 20 to 50 percent slopes, rubbly**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,330 to 6,330 feet

*Mean annual precipitation:* 14 to 16 inches

*Frost-free period:* 70 to 90 days

**Component Description**

**Whitlash, rubbly and similar soils**

*Composition:* 75 percent

*Geomorphic description:*

- Backslope on south-tending hill
- Shoulder on south-tending hill

*Slope:* 30 to 50 percent, east to northwest aspects

*Elevation:* 5,330 to 6,330 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Very gravelly sandy loam

*Rock fragments on the soil surface:* 15 to 60 percent stones, 2 to 3 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Well drained

*Parent material:* Colluvium over residuum weathered from quartzite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.1 inches

*Typical profile:*

A—0 to 4 inches; very gravelly sandy loam

Bw—4 to 12 inches; very gravelly sandy loam

BC—12 to 15 inches; very gravelly sandy loam

R—15 to 19 inches; bedrock

**Frenchcreek, rubbly and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Footslope on south-tending hill

*Slope:* 20 to 35 percent, east to northwest aspects

*Elevation:* 5,330 to 6,330 feet

*Effective annual precipitation:* 12 to 14 inches



*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Very gravelly loam  
*Rock fragments on the soil surface:* 15 to 60 percent stones, 2 to 3 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Colluvium derived from quartzite  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 2.8 inches  
*Typical profile:*  
A—0 to 5 inches; very gravelly loam  
Bw1—5 to 12 inches; very gravelly loam  
Bw2—12 to 26 inches; extremely gravelly sandy loam  
C1—26 to 36 inches; very gravelly loamy sand  
C2—36 to 60 inches; extremely gravelly sandy loam

#### **Additional Components**

Rock outcrop: 5 percent  
Rubble land: 5 percent

### **923F—Whitore, rubbly-Poin, rubbly-Rock outcrop complex, 25 to 60 percent slopes**

#### **Map Unit Setting**

*Interpretive focus:* Forestland  
*Elevation:* 5,380 to 7,820 feet  
*Mean annual precipitation:* 11 to 14 inches  
*Frost-free period:* 50 to 70 days

#### **Component Description**

##### **Whitore, rubbly and similar soils**

*Composition:* 40 percent  
*Geomorphic description:* Backslope on north-tending mountain  
*Slope:* 25 to 60 percent, west to southeast aspects  
*Elevation:* 5,380 to 7,820 feet  
*Effective annual precipitation:* 15 to 17 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Very cobbly loam  
*Rock fragments on the soil surface:* 15 to 30 percent boulders, 3 to 10 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Calcareous colluvium derived from quartzite  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 5.6 inches  
*Typical profile:*  
A—0 to 5 inches; very cobbly loam  
E—5 to 8 inches; gravelly loam  
Bw—8 to 14 inches; very gravelly loam  
Bk1—14 to 21 inches; very gravelly loam  
Bk2—21 to 60 inches; very gravelly loam

**Poin, rubbly and similar soils**

*Composition:* 20 percent

*Geomorphic description:* Nose slope shoulder on north-tending mountain

*Slope:* 30 to 60 percent, west to southeast aspects

*Elevation:* 5,380 to 7,820 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very cobbly sandy loam

*Rock fragments on the soil surface:* 15 to 30 percent boulders, 3 to 10 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Well drained

*Parent material:* Residuum weathered from quartzite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 1.0 inches

*Typical profile:*

A—0 to 5 inches; very cobbly sandy loam

Bw—5 to 12 inches; very cobbly loam

C—12 to 15 inches; extremely cobbly sandy loam

R—15 to 60 inches; bedrock

**Rock outcrop**

*Composition:* 15 percent

**Additional Components**

Skaggs, rubbly and similar soils: 10 percent

Tiban, extremely stony and similar soils: 10 percent

Rubble land: 5 percent

**924F—Whitlash, extremely stony-Gnojek, extremely stony-Rock outcrop complex, 20 to 60 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,300 to 6,970 feet

*Mean annual precipitation:* 14 to 16 inches

*Frost-free period:* 70 to 90 days

**Component Description**

**Whitlash, extremely stony and similar soils**

*Composition:* 35 percent

*Geomorphic description:*

- Shoulder on south-tending mountain
- Backslope on south-tending mountain

*Slope:* 30 to 60 percent, east to northwest aspects

*Elevation:* 5,300 to 6,970 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Very gravelly sandy loam

*Rock fragments on the soil surface:* 3 to 15 percent stones, 2 to 10 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Well drained

*Parent material:* Colluvium over residuum weathered from quartzite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.1 inches

*Typical profile:*

A—0 to 4 inches; very gravelly sandy loam

Bw—4 to 12 inches; very gravelly sandy loam

BC—12 to 15 inches; very gravelly sandy loam

R—15 to 60 inches; bedrock

**Gnojek, extremely stony and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Backslope on south-tending mountain

*Slope:* 20 to 50 percent, east to northwest aspects

*Elevation:* 5,300 to 6,970 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Very gravelly sandy loam

*Rock fragments on the soil surface:* 3 to 15 percent stones, 2 to 10 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Well drained

*Parent material:* Residuum weathered from quartzite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.2 inches

*Typical profile:*

A—0 to 3 inches; very gravelly sandy loam

Bt—3 to 10 inches; very channery sandy clay loam

Bk—10 to 15 inches; very channery sandy loam

R—15 to 60 inches; bedrock

**Rock outcrop**

*Composition:* 20 percent

**Reedpoint, extremely stony and similar soils**

*Composition:* 15 percent

*Geomorphic description:*

- Shoulder on south-tending mountain
- Summit on south-tending mountain

*Slope:* 30 to 60 percent, east to northwest aspects

*Elevation:* 5,300 to 6,970 feet

*Effective annual precipitation:* 12 to 14 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Very gravelly sandy loam

*Rock fragments on the soil surface:* 3 to 15 percent stones, 2 to 10 feet apart

*Depth to restrictive feature:* Lithic bedrock: 3 to 10 inches

*Drainage class:* Well drained

*Parent material:* Colluvium over residuum weathered from quartzite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 0.3 inches

*Typical profile:*

A—0 to 4 inches; very gravelly sandy loam

BC—4 to 5 inches; very gravelly sandy loam

R—5 to 60 inches; bedrock

## **926F—Rubick-Tigeron complex, 30 to 60 percent slopes, very stony**

### **Map Unit Setting**

*Interpretive focus:* Forestland  
*Elevation:* 5,300 to 7,870 feet  
*Mean annual precipitation:* 14 to 18 inches  
*Frost-free period:* 30 to 50 days

### **Component Description**

#### **Rubick, very stony and similar soils**

*Composition:* 60 percent  
*Geomorphic description:* Backslope on north-tending mountain  
*Slope:* 30 to 60 percent, west to southeast aspects  
*Elevation:* 5,300 to 7,870 feet  
*Effective annual precipitation:* 17 to 19 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Very cobbly sandy loam  
*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Somewhat excessively drained  
*Parent material:* Colluvium derived from quartzite  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 2.7 inches  
*Typical profile:*  
    Oi—0 to 2 inches; slightly decomposed plant material  
    A—2 to 3 inches; very cobbly sandy loam  
    E1—3 to 8 inches; very cobbly sandy loam  
    E2—8 to 13 inches; very cobbly sandy loam  
    Bw—13 to 27 inches; very cobbly sandy loam  
    BC—27 to 60 inches; extremely stony loamy sand

#### **Tigeron, very stony and similar soils**

*Composition:* 25 percent  
*Geomorphic description:* Head slope backslope on north-tending mountain  
*Slope:* 30 to 50 percent, west to southeast aspects  
*Elevation:* 5,660 to 7,870 feet  
*Effective annual precipitation:* 17 to 19 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Cobbly sandy loam  
*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Alluvium and/or colluvium derived from quartzite  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 4.3 inches  
*Typical profile:*  
    Oi—0 to 2 inches; slightly decomposed plant material  
    E1—2 to 7 inches; cobbly sandy loam  
    E2—7 to 13 inches; very cobbly sandy loam  
    E and Bt—13 to 18 inches; very cobbly sandy loam

Bt—18 to 34 inches; very cobbly sandy clay loam

BC—34 to 60 inches; very gravelly sandy loam

### **Additional Components**

Poin, extremely stony and similar soils: 10 percent

Rock outcrop: 5 percent

## **927E—Tigeron, very stony-Rubick, very stony-Tigeron, stony complex, 15 to 45 percent slopes**

### **Map Unit Setting**

*Interpretive focus:* Forestland

*Elevation:* 6,130 to 7,590 feet

*Mean annual precipitation:* 16 to 18 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Tigeron, very stony and similar soils**

*Composition:* 35 percent

*Geomorphic description:* Backslope on south-tending mountain

*Slope:* 15 to 45 percent, east to northwest aspects

*Elevation:* 6,140 to 7,600 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very cobbly sandy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from quartzite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 4.3 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

E1—2 to 7 inches; very cobbly sandy loam

E2—7 to 13 inches; very cobbly sandy loam

E and Bt—13 to 18 inches; very cobbly sandy loam

Bt—18 to 34 inches; very cobbly sandy clay loam

BC—34 to 60 inches; very gravelly sandy loam

#### **Rubick, very stony and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Backslope on south-tending mountain

*Slope:* 15 to 45 percent, east to northwest aspects

*Elevation:* 6,140 to 7,600 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very cobbly sandy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Somewhat excessively drained

*Parent material:* Colluvium derived from quartzite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 2.7 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

A—2 to 3 inches; very cobbly sandy loam

E1—3 to 8 inches; very cobbly sandy loam

E2—8 to 13 inches; very cobbly sandy loam

Bw—13 to 27 inches; very cobbly sandy loam

BC—27 to 60 inches; extremely stony loamy sand

### **Tigeron, stony and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Head slope backslope on south-tending mountain

*Slope:* 15 to 35 percent, east to northwest aspects

*Elevation:* 6,140 to 7,600 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Cobbly sandy loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium and/or colluvium derived from quartzite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 4.3 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

E1—2 to 7 inches; cobbly sandy loam

E2—7 to 13 inches; very cobbly sandy loam

E and Bt—13 to 18 inches; very cobbly sandy loam

Bt—18 to 34 inches; very cobbly sandy clay loam

BC—34 to 60 inches; very gravelly sandy loam

### **Additional Components**

Poin, extremely stony and similar soils: 10 percent

Rock outcrop: 5 percent

Sebud, very stony and similar soils: 5 percent

## **928E—Mawspring-Maurice complex, 15 to 45 percent slopes, very stony**

### **Map Unit Setting**

*Interpretive focus:* Forestland and rangeland

*Elevation:* 6,050 to 7,550 feet

*Mean annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Mawspring, very stony and similar soils**

*Composition:* 50 percent

*Geomorphic description:* Backslope on north-tending mountain

*Slope:* 20 to 45 percent, west to southeast aspects

*Elevation:* 6,050 to 7,550 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very channery loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from quartzite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 3.2 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

A—2 to 6 inches; very channery loam

Bw—6 to 18 inches; very channery loam

BC—18 to 33 inches; extremely channery sandy loam

C—33 to 60 inches; extremely channery sandy loam

#### **Maurice, very stony and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Backslope on north-tending mountain

*Slope:* 15 to 35 percent, west to southeast aspects

*Elevation:* 6,050 to 7,550 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Channery loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Colluvium derived from quartzite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.6 inches

*Typical profile:*

A1—0 to 5 inches; channery loam

A2—5 to 12 inches; very channery loam

Bw—12 to 21 inches; very channery loam

BC—21 to 33 inches; very channery loam

C—33 to 60 inches; very channery loam

#### **Additional Components**

Sebud, very stony and similar soils: 12 percent

Sigbird, very stony and similar soils: 8 percent

### **929F—Rubick, very stony-Poin, extremely bouldery complex, 25 to 60 percent slopes**

#### **Map Unit Setting**

*Interpretive focus:* Forestland and rangeland

*Elevation:* 5,820 to 7,550 feet

*Mean annual precipitation:* 14 to 18 inches

*Frost-free period:* 50 to 70 days

## Component Description

### **Rubick, very stony and similar soils**

*Composition:* 65 percent

*Geomorphic description:* Backslope on north-tending mountain

*Slope:* 25 to 60 percent, west to southeast aspects

*Elevation:* 5,820 to 7,550 feet

*Effective annual precipitation:* 17 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very cobbly sandy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Somewhat excessively drained

*Parent material:* Colluvium derived from quartzite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 2.7 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

A—2 to 3 inches; very cobbly sandy loam

E1—3 to 8 inches; very cobbly sandy loam

E2—8 to 13 inches; very cobbly sandy loam

Bw—13 to 27 inches; very cobbly sandy loam

BC—27 to 60 inches; extremely stony loamy sand

### **Poin, extremely bouldery and similar soils**

*Composition:* 20 percent

*Geomorphic description:*

- Nose slope shoulder on north-tending mountain
- Nose slope summit on north-tending mountain

*Slope:* 30 to 60 percent, west to southeast aspects

*Elevation:* 5,820 to 7,550 feet

*Effective annual precipitation:* 17 to 19 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very cobbly sandy loam

*Rock fragments on the soil surface:* 3 to 15 percent boulders, 3 to 10 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Well drained

*Parent material:* Residuum weathered from quartzite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.0 inches

*Typical profile:*

A—0 to 5 inches; very cobbly sandy loam

Bw—5 to 12 inches; very cobbly loam

C—12 to 15 inches; extremely cobbly sandy loam

R—15 to 60 inches; bedrock

## Additional Components

Tigeron, very stony and similar soils: 13 percent

Rock outcrop: 2 percent



## **930F—Ratiopeak-Tiban complex, 25 to 60 percent slopes, very stony**

### **Map Unit Setting**

*Interpretive focus:* Rangeland and forestland

*Elevation:* 5,250 to 7,450 feet

*Mean annual precipitation:* 12 to 18 inches

*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Ratiopeak, very stony and similar soils**

*Composition:* 55 percent

*Geomorphic description:* Backslope on mountain

*Slope:* 25 to 60 percent

*Elevation:* 5,250 to 7,450 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very cobbly loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium and/or colluvium derived from quartzite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.8 inches

*Typical profile:*

A1—0 to 4 inches; very cobbly loam

A2—4 to 10 inches; very cobbly loam

Bt1—10 to 14 inches; very cobbly loam

Bt2—14 to 26 inches; very cobbly sandy clay loam

Bk—26 to 60 inches; very cobbly sandy loam

#### **Tiban, very stony and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Backslope on mountain

*Slope:* 30 to 60 percent

*Elevation:* 5,250 to 7,450 feet

*Effective annual precipitation:* 14 to 16 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very cobbly loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Calcareous colluvium derived from quartzite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 5.6 inches

*Typical profile:*

A—0 to 8 inches; very cobbly loam

Bw—8 to 16 inches; very cobbly loam

Bk—16 to 60 inches; very gravelly loam

### **Additional Components**

Sebud, very stony and similar soils: 12 percent  
Poin, extremely stony and similar soils: 10 percent  
Rock outcrop: 8 percent

## **931E—Ratiopeak-Monaberg complex, 8 to 30 percent slopes, very stony**

### **Map Unit Setting**

*Interpretive focus:* Rangeland and forestland  
*Elevation:* 5,710 to 7,430 feet  
*Mean annual precipitation:* 13 to 17 inches  
*Frost-free period:* 50 to 70 days

### **Component Description**

#### **Ratiopeak, very stony and similar soils**

*Composition:* 60 percent  
*Geomorphic description:* Backslope on hill  
*Slope:* 15 to 30 percent  
*Elevation:* 5,710 to 7,430 feet  
*Effective annual precipitation:* 14 to 16 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Very cobbly loam  
*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Alluvium and/or colluvium derived from quartzite  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 5.8 inches  
*Typical profile:*  
    A1—0 to 4 inches; very cobbly loam  
    A2—4 to 10 inches; very cobbly loam  
    Bt1—10 to 14 inches; very cobbly loam  
    Bt2—14 to 26 inches; very cobbly sandy clay loam  
    Bk—26 to 60 inches; very cobbly sandy loam

#### **Monaberg, very stony and similar soils**

*Composition:* 20 percent  
*Geomorphic description:* Backslope on open meadows on hill  
*Slope:* 8 to 25 percent  
*Elevation:* 5,710 to 7,430 feet  
*Effective annual precipitation:* 14 to 16 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Gravelly loam  
*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Alluvium derived from quartzite  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 8.3 inches

*Typical profile:*

- A—0 to 10 inches; gravelly loam
- Bt—10 to 28 inches; gravelly sandy clay loam
- C—28 to 60 inches; gravelly sandy clay loam

**Additional Components**

Mawspring, very stony and similar soils: 10 percent  
Monaberg, stony, wet and similar soils: 5 percent  
Poin, very stony and similar soils: 5 percent

**932D—Tigeron-Rubick complex, 2 to 15 percent slopes,  
very stony**

**Map Unit Setting**

*Interpretive focus:* Forestland  
*Elevation:* 5,950 to 6,630 feet  
*Mean annual precipitation:* 17 to 19 inches  
*Frost-free period:* 30 to 50 days

**Component Description**

**Tigeron, very stony and similar soils**

*Composition:* 65 percent  
*Geomorphic description:* Foothills on mountain  
*Slope:* 2 to 8 percent  
*Elevation:* 5,950 to 6,630 feet  
*Effective annual precipitation:* 17 to 19 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Gravelly loam  
*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Colluvium derived from quartzite  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 4.3 inches  
*Typical profile:*

- Oi—0 to 2 inches; slightly decomposed plant material
- E1—2 to 7 inches; gravelly loam
- E2—7 to 13 inches; very cobbly sandy loam
- E and Bt—13 to 18 inches; very cobbly sandy loam
- Bt—18 to 34 inches; very cobbly sandy clay loam
- BC—34 to 60 inches; very gravelly sandy loam

**Rubick, very stony and similar soils**

*Composition:* 30 percent  
*Geomorphic description:* Foothills on mountain  
*Slope:* 8 to 15 percent  
*Elevation:* 5,950 to 6,630 feet  
*Effective annual precipitation:* 17 to 19 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Very gravelly sandy loam  
*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted  
*Drainage class:* Somewhat excessively drained  
*Parent material:* Colluvium derived from quartzite  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 2.7 inches  
*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material  
A—2 to 3 inches; very gravelly sandy loam  
E1—3 to 8 inches; very cobbly sandy loam  
E2—8 to 13 inches; very cobbly sandy loam  
Bw—13 to 27 inches; very cobbly sandy loam  
BC—27 to 60 inches; extremely stony loamy sand

#### **Additional Components**

Silas, stony, wet meadows and similar soils: 5 percent

### **933B—Foxgulch, occasionally flooded-Bearmouth, rarely flooded complex, 0 to 4 percent slopes, stony**

#### **Map Unit Setting**

*Interpretive focus:* Riparian  
*Elevation:* 6,170 to 6,380 feet  
*Mean annual precipitation:* 15 to 17 inches  
*Frost-free period:* 30 to 50 days

#### **Component Description**

##### **Foxgulch, stony and similar soils**

*Composition:* 70 percent  
*Geomorphic description:*

- Broad channel
- Flood plain

*Slope:* 0 to 2 percent  
*Elevation:* 6,170 to 6,380 feet  
*Effective annual precipitation:* 15 to 17 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Loam  
*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Somewhat poorly drained  
*Parent material:* Sandy and gravelly alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* Occasional  
*Water table:* Present  
*Available water capacity:* Mainly 7.8 inches  
*Typical profile:*

Oi—0 to 1 inches; slightly decomposed plant material  
A—1 to 12 inches; loam  
Bw—12 to 30 inches; loam  
BC—30 to 46 inches; sandy clay loam  
2C—46 to 60 inches; very gravelly coarse sand

**Bearmouth, stony and similar soils**

*Composition:* 25 percent

*Geomorphic description:* Flood plain

*Slope:* 0 to 4 percent

*Elevation:* 6,170 to 6,380 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Gravelly sandy loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Sandy and gravelly alluvium

*Native plant cover type:* Rangeland

*Flooding:* Rare

*Available water capacity:* Mainly 2.2 inches

*Typical profile:*

A—0 to 6 inches; gravelly sandy loam

Bw—6 to 11 inches; gravelly coarse sandy loam

BC—11 to 18 inches; gravelly coarse sandy loam

2C1—18 to 34 inches; very cobbly loamy coarse sand

2C2—34 to 60 inches; very cobbly sand

**Additional Components**

Kilgore and similar soils: 5 percent

**935D—Anaconda sandy loam, 8 to 15 percent slopes,  
moderately impacted**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 4,800 to 5,300 feet

*Mean annual precipitation:* 10 to 14 inches

*Frost-free period:* 75 to 105 days

**Component Description**

**Anaconda, moderately impacted and similar soils**

*Composition:* 85 percent

*Geomorphic description:*

- Alluvial fan
- Stream terrace

*Slope:* 8 to 15 percent

*Elevation:* 4,800 to 5,300 feet

*Effective annual precipitation:* 10 to 14 inches

*Frost-free period:* 75 to 105 days

*Surface layer texture:* Sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Coarse-loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 7.8 inches

*Typical profile:*

- A1—0 to 0 inches; sandy loam
- A2—0 to 8 inches; sandy loam
- Bw—8 to 14 inches; sandy loam
- Bk1—14 to 27 inches; sandy loam
- Bk2—27 to 60 inches; sandy loam

**Additional Components**

Con, moderately impacted and similar soils: 5 percent  
Gregson, moderately impacted and similar soils: 5 percent  
Sixbeacon, moderately impacted and similar soils: 5 percent

**936B—Foxgulch, rarely flooded-Kilgore, occasionally  
flooded complex, 0 to 4 percent slopes, very stony**

**Map Unit Setting**

*Interpretive focus:* Forestland  
*Elevation:* 5,720 to 6,300 feet  
*Mean annual precipitation:* 16 to 18 inches  
*Frost-free period:* 30 to 50 days

**Component Description**

**Foxgulch, very stony and similar soils**

*Composition:* 40 percent  
*Geomorphic description:* Flood plain  
*Slope:* 2 to 4 percent  
*Elevation:* 5,720 to 6,300 feet  
*Effective annual precipitation:* 16 to 18 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Cobbly silt loam  
*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Somewhat poorly drained  
*Parent material:* Alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* Rare  
*Water table:* Present  
*Available water capacity:* Mainly 7.8 inches  
*Typical profile:*

- Oi—0 to 1 inches; slightly decomposed plant material
- A—1 to 12 inches; cobbly silt loam
- Bw—12 to 30 inches; loam
- BC—30 to 46 inches; sandy clay loam
- 2C—46 to 60 inches; very gravelly coarse sand

**Kilgore, very stony and similar soils**

*Composition:* 30 percent  
*Geomorphic description:* Flood plain  
*Slope:* 0 to 4 percent  
*Elevation:* 5,720 to 6,300 feet  
*Effective annual precipitation:* 16 to 18 inches  
*Frost-free period:* 30 to 50 days

*Surface layer texture:* Cobbly silt loam  
*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Poorly drained  
*Parent material:* Alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* Occasional  
*Water table:* Present  
*Available water capacity:* Mainly 6.4 inches  
*Typical profile:*  
Oi—0 to 2 inches; slightly decomposed plant material  
A—2 to 19 inches; cobbly silt loam  
Ag—19 to 29 inches; loam  
2Cg—29 to 38 inches; gravelly sandy loam  
2C—38 to 60 inches; very gravelly coarse sand

#### **Additional Components**

Bearmouth, very stony and similar soils: 10 percent  
Riverwash: 8 percent  
Water: 7 percent  
Mooseflat, very stony and similar soils: 5 percent

### **939F—Evaro, stony-Tigeron complex, 20 to 50 percent slopes**

#### **Map Unit Setting**

*Interpretive focus:* Forestland  
*Elevation:* 5,950 to 7,640 feet  
*Mean annual precipitation:* 15 to 17 inches  
*Frost-free period:* 30 to 50 days

#### **Component Description**

##### **Evaro, stony and similar soils**

*Composition:* 65 percent  
*Geomorphic description:* Backslope on north-tending mountain slope  
*Slope:* 20 to 50 percent, west to east aspects  
*Elevation:* 5,950 to 7,640 feet  
*Effective annual precipitation:* 17 to 19 inches  
*Frost-free period:* 30 to 50 days  
*Surface layer texture:* Gravelly ashy sandy loam  
*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart  
*Depth to restrictive feature:* None noted  
*Drainage class:* Somewhat excessively drained  
*Parent material:* Colluvium derived from quartzite  
*Native plant cover type:* Forestland  
*Flooding:* None  
*Available water capacity:* Mainly 4.3 inches  
*Typical profile:*  
Oi—0 to 1 inches; slightly decomposed plant material  
Oe—1 to 3 inches; moderately decomposed plant material  
A—3 to 8 inches; gravelly ashy sandy loam  
E—8 to 21 inches; very gravelly sandy loam  
E and Bt—21 to 60 inches; very gravelly sandy clay loam

**Tigeron and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Head slope backslope on north-tending mountain

*Slope:* 20 to 50 percent, west to east aspects

*Elevation:* 5,950 to 7,640 feet

*Effective annual precipitation:* 17 to 19 inches

*Frost-free period:* 30 to 50 days

*Surface layer texture:* Gravelly sandy loam

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium and/or colluvium derived from quartzite

*Native plant cover type:* Forestland

*Flooding:* None

*Available water capacity:* Mainly 4.3 inches

*Typical profile:*

Oi—0 to 2 inches; slightly decomposed plant material

E1—2 to 7 inches; gravelly sandy loam

E2—7 to 13 inches; very cobbly sandy loam

E and Bt—13 to 18 inches; very cobbly sandy loam

Bt—18 to 34 inches; very cobbly sandy clay loam

BC—34 to 60 inches; very gravelly sandy loam

**Additional Components**

Poin, very stony and similar soils: 4 percent

Rock outcrop: 1 percent

**940E—Ratiopeak, stony-Tiban, very stony complex,  
8 to 25 percent slopes**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,280 to 7,500 feet

*Mean annual precipitation:* 14 to 18 inches

*Frost-free period:* 50 to 70 days

**Component Description**

**Ratiopeak, stony and similar soils**

*Composition:* 75 percent

*Geomorphic description:* Backslope on mountain

*Slope:* 8 to 25 percent

*Elevation:* 5,280 to 7,500 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Alluvium and/or colluvium derived from quartzite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.8 inches



*Typical profile:*

- A1—0 to 4 inches; gravelly loam
- A2—4 to 10 inches; very cobbly loam
- Bt1—10 to 14 inches; very cobbly loam
- Bt2—14 to 26 inches; very cobbly sandy clay loam
- Bk—26 to 60 inches; very cobbly sandy loam

**Tiban, very stony and similar soils**

*Composition:* 15 percent

*Geomorphic description:* Backslope on mountain

*Slope:* 8 to 25 percent

*Elevation:* 5,280 to 7,500 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Very cobbly loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Calcareous colluvium derived from quartzite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 5.6 inches

*Typical profile:*

- A—0 to 8 inches; very cobbly loam
- Bw—8 to 16 inches; very cobbly loam
- Bk—16 to 60 inches; very gravelly loam

**Additional Components**

Libeg and similar soils: 10 percent

**941E—Bridger gravelly loam, 12 to 30 percent slopes,  
stony**

**Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,810 to 6,820 feet

*Mean annual precipitation:* 16 to 18 inches

*Frost-free period:* 50 to 70 days

**Component Description**

**Bridger, stony and similar soils**

*Composition:* 85 percent

*Geomorphic description:* Backslope on south-tending hill

*Slope:* 12 to 30 percent, east to northwest aspects

*Elevation:* 5,810 to 6,820 feet

*Effective annual precipitation:* 15 to 17 inches

*Frost-free period:* 50 to 70 days

*Surface layer texture:* Gravelly loam

*Rock fragments on the soil surface:* 0.01 to 0.10 percent stones, 40 to 100 feet apart

*Depth to restrictive feature:* None noted

*Drainage class:* Well drained

*Parent material:* Red shale alluvium and/or colluvium derived from quartzite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 7.1 inches

*Typical profile:*

A—0 to 4 inches; gravelly loam

Bt—4 to 17 inches; clay

Btk—17 to 21 inches; gravelly clay loam

Bk1—21 to 29 inches; very gravelly sandy clay loam

Bk2—29 to 60 inches; very gravelly sandy clay loam

### **Additional Components**

Adel and similar soils: 10 percent

Redchief, stony and similar soils: 5 percent

## **942F—Whitlash-Gnojek complex, 20 to 60 percent slopes, very stony**

### **Map Unit Setting**

*Interpretive focus:* Rangeland

*Elevation:* 5,610 to 6,270 feet

*Mean annual precipitation:* 12 to 15 inches

*Frost-free period:* 70 to 90 days

### **Component Description**

#### **Whitlash, very stony and similar soils**

*Composition:* 60 percent

*Geomorphic description:*

- Shoulder on south-tending hill
- Backslope on south-tending hill

*Slope:* 30 to 60 percent, east to northwest aspects

*Elevation:* 5,610 to 6,270 feet

*Effective annual precipitation:* 10 to 13 inches

*Frost-free period:* 70 to 90 days

*Surface layer texture:* Very gravelly sandy loam

*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart

*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches

*Drainage class:* Well drained

*Parent material:* Colluvium over residuum weathered from quartzite

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.1 inches

*Typical profile:*

A—0 to 4 inches; very gravelly sandy loam

Bw—4 to 12 inches; very gravelly sandy loam

BC—12 to 15 inches; very gravelly sandy loam

R—15 to 19 inches; bedrock

#### **Gnojek, very stony and similar soils**

*Composition:* 30 percent

*Geomorphic description:* Backslope on south-tending hill

*Slope:* 20 to 50 percent, east to northwest aspects

*Elevation:* 5,610 to 6,270 feet

*Effective annual precipitation:* 10 to 13 inches  
*Frost-free period:* 70 to 90 days  
*Surface layer texture:* Very gravelly sandy loam  
*Rock fragments on the soil surface:* 0.10 to 3.00 percent stones, 7 to 40 feet apart  
*Depth to restrictive feature:* Lithic bedrock: 10 to 20 inches  
*Drainage class:* Well drained  
*Parent material:* Residuum weathered from quartzite  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 1.2 inches  
*Typical profile:*  
    A—0 to 3 inches; very gravelly sandy loam  
    Bt—3 to 10 inches; very channery sandy clay loam  
    Bk—10 to 15 inches; very channery sandy loam  
    R—15 to 60 inches; bedrock

#### **Additional Components**

Frenchcreek, very stony and similar soils: 8 percent  
Rock outcrop: 2 percent

### **943D—Bridger-Adel complex, 4 to 15 percent slopes**

#### **Map Unit Setting**

*Interpretive focus:* Rangeland  
*Elevation:* 6,040 to 6,840 feet  
*Mean annual precipitation:* 15 to 17 inches  
*Frost-free period:* 50 to 70 days

#### **Component Description**

##### **Bridger and similar soils**

*Composition:* 75 percent  
*Geomorphic description:* Hillslope  
*Slope:* 4 to 15 percent  
*Elevation:* 6,040 to 6,840 feet  
*Effective annual precipitation:* 15 to 17 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Gravelly loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Red shale alluvium and/or colluvium derived from quartzite  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 7.1 inches  
*Typical profile:*  
    A—0 to 4 inches; gravelly loam  
    Bt—4 to 17 inches; clay  
    Btk—17 to 21 inches; gravelly clay loam  
    Bk1—21 to 29 inches; very gravelly sandy clay loam  
    Bk2—29 to 60 inches; very gravelly sandy clay loam

##### **Adel and similar soils**

*Composition:* 20 percent  
*Geomorphic description:* Hillslope

*Slope:* 4 to 12 percent  
*Elevation:* 6,040 to 6,840 feet  
*Effective annual precipitation:* 15 to 17 inches  
*Frost-free period:* 50 to 70 days  
*Surface layer texture:* Loam  
*Depth to restrictive feature:* None noted  
*Drainage class:* Well drained  
*Parent material:* Alluvium  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 9.6 inches  
*Typical profile:*  
    A1—0 to 8 inches; loam  
    A2—8 to 24 inches; silt loam  
    A3—24 to 33 inches; silt loam  
    Bw1—33 to 45 inches; silty clay loam  
    Bw2—45 to 60 inches; clay loam

#### **Additional Components**

Redchief and similar soils: 5 percent

### **992—Pits, borrow**

#### **Map Unit Setting**

*Elevation:* 5,080 to 6,330 feet

#### **Component Description**

##### **Pits, borrow**

*Composition:* 100 percent

### **994—Pits, mine**

#### **Map Unit Setting**

*Elevation:* 5,040 to 6,360 feet

#### **Component Description**

##### **Pits, mine**

*Composition:* 100 percent

### **995—Dumps, garbage**

#### **Map Unit Setting**

*Elevation:* 5,450 to 6,400 feet

#### **Component Description**

##### **Dumps, garbage**

*Composition:* 100 percent

## 997—Dumps, mine

### Map Unit Setting

*Elevation:* 5,310 to 6,460 feet

### Component Description

#### Dumps, mine

*Composition:* 100 percent

## 998—Rock outcrop and Rubble land

### Map Unit Setting

*Field investigation intensity:* Order 3

### Component Description

#### Rock outcrop

*Composition:* 0 to 100 percent

*Definition:* Rock outcrop consists of exposures of bare bedrock

#### Rubble land

*Composition:* 0 to 100 percent

*Definition:* Rubble land consists of areas of cobbles, stones, and boulders

## Gravel pits

### Component Description

#### Gravel pits

*Composition:* 100 percent

## M-W—Miscellaneous water

### Component Description

#### Miscellaneous water

*Composition:* 100 percent

## W—Water

### Map Unit Setting

*Field investigation intensity:* Order 2

### Component Description

#### Water

*Composition:* 100 percent

*Definition:* Water includes streams, lakes, ponds, and reservoirs that in most years are covered with water at least during the period warm enough for plants to grow. Many areas are covered with water throughout the year.



# Use and Management of the Soils

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This soil survey is an inventory and evaluation of soils in the survey area. It can be used to coordinate land uses to the limitations and potentials of natural resources and the environment. In addition, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of soils. They collect data on soil physical properties, chemical properties, related site observations, and other factors that affect various soil uses and management. Field experience and collected performance data are used as a basis in predicting soil behavior.

Information in this section can be used to plan use and management of soils for crops and pasture; as rangeland and forestland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; for agricultural waste management; and as wildlife habitat. This information can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of gravel, sand, reclamation material, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, camp areas, playgrounds, lawns, and appropriate trees and shrubs.

## Interpretive Ratings

The interpretive tables in this survey rate the soils in the survey area for various uses. Some tables identify the limitations that affect specified uses and indicate the severity of those limitations. Other tables identify the potential or the degree of potential existing. Typically, the ratings in these tables are in both text and numerical format.

### Rating Class Terms

Rating classes are expressed in the tables in terms that indicate the extent to which the soils are limited by the soil features that affect a specified use or in terms that indicate the suitability of the soils for the use. Thus, the tables may show limitation classes or suitability classes. Terms for limitation classes are *not limited*, *somewhat limited*, and *very limited*. The suitability ratings are expressed as *well suited*, *moderately suited*, *poorly suited*, and *unsuited* or as *good*, *fair*, and *poor*.

### Numerical Ratings

Numerical ratings in the tables indicate the relative severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate

gradations between the point at which a soil feature has the greatest negative impact on the use and the point at which the soil feature is not a limitation. The limitations appear in order from the most limiting to the least limiting. Thus, if more than one limitation is identified, the most severe limitation is listed first and the least severe one is listed last. Potential interpretations are labeled as such, with the lower number having the lowest potential and the higher number having the greatest potential for a use or material.

## General Land Access and Management

The “Hazard of Erosion and Suitability for Roads and Trails” table shows interpretive ratings related to hazard of erosion (disturbed site), hazard of erosion on roads and trails, and suitability for roads (natural surface).

Ratings in the column *hazard of erosion* (disturbed site) are based on slope and on soil erodibility K factor. Soil loss is caused by sheet or rill erosion in off-road or off-trail areas where 50 to 75 percent of the surface has been exposed by logging, grazing, mining, or other kinds of disturbance. The hazard is described as slight, moderate, severe, or very severe. A rating of *slight* indicates erosion is unlikely under ordinary climatic conditions; *moderate* indicates some erosion is likely, and erosion-control measures may be needed; *severe* indicates erosion is very likely, and erosion-control measures, including revegetation of bare areas, are advised; and very severe indicates significant erosion is expected, loss of soil productivity and offsite damage are likely, and erosion-control measures are costly and generally impractical.

Ratings in the column *hazard of erosion on roads and trails* are based on soil erodibility K factor, slope, and content of rock fragments. Ratings apply to unsurfaced roads and trails. The hazard is described as slight, moderate, or severe. A rating of *slight* indicates little or no erosion is likely. A rating of *moderate* indicates some erosion is likely; roads or trails may require occasional maintenance; and simple erosion-control measures are needed. A rating of *severe* indicates significant erosion is expected; roads or trails require frequent maintenance; and costly erosion-control measures are needed.

Ratings in the column *suitability for roads (natural surface)* are based on slope, rock fragments on the surface, plasticity index, content of sand, Unified classification, depth to a water table, ponding, flooding, and hazard of soil slippage. The ratings indicate the suitability for using the natural surface of the soil for roads. The soils are described as well suited, moderately suited, or poorly suited to this use.

The “Soil Damage by Fire, Fencing Limitations, and Soil Rutting Hazard” table shows interpretive ratings related to susceptibility of the soil to damage by fire, fencing limitations, and soil rutting hazard.

Ratings in the column *susceptibility of the soil to damage by fire* are based on texture of the surface layer, content of rock fragments and organic matter in the surface layer, thickness of the surface layer, and slope. The ratings indicate an evaluation of the potential impact of prescribed fires or wildfires intense enough to remove the duff layer and consume organic matter in the surface layer.

Rating class terms for fire damage are expressed as low, moderate, and high. Where these terms are used, the numerical ratings indicate gradations between the point at which susceptibility to fire damage is highest (1.00) and the point at which susceptibility is lowest (0.00).

Rating class terms for *fencing limitations* are based on soil texture, flooding frequency, depth to bedrock, coarse fragments, shrink swell potential, slope, depth to water table, potential frost action, salinity, ponding, depth to cemented pan, and surface rock fragments. The soils are described as being very limited, limited, and not limited. Ratings indicate an evaluation of the limitation of the soil for installing fencing, typically driven, or dug, wooden or steel posts.



Ratings in the column *soil rutting hazard* are based on depth to a water table, rock fragments on or below the surface, Unified classification, depth to a restrictive layer, and slope. The operation of forest equipment may cause ruts to form. The hazard is described as slight, moderate, or severe. A rating of *slight* indicates the soil is subject to little or no rutting; *moderate* indicates rutting is likely; and *severe* indicates ruts form readily.

## Agronomy

Richard Fasching, Montana State Agronomist, Natural Resources Conservation Service, prepared this section.

### Crops and Pasture

General management needed for crops and pasture is suggested in this section. The estimated yields of the main crops and pasture plants are listed, and the system of land capability classification used by the Natural Resources Conservation Service is explained.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under the heading "[Detailed Soil Map Units](#)." Specific information can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

The Silver Bow County Area and Parts of Beaverhead and Jefferson Counties soil survey contains a very limited amount of cropland. The primary land use for tilled acreage is pasture or hayland. Acreage is usually cropped for the purpose of reestablishing pasture or hayland. Cropland and pasture are predominantly flood irrigated. Due to low flood-irrigation efficiencies, many "dryland" acres are characteristically artificially subirrigated where the water table rises during the growing season because of overirrigation of adjacent lands. The main pasture forage species include Garrison creeping meadow foxtail and an assortment of other grasses adapted to cool temperatures and high elevations.

The primary concerns on irrigated cropland are employing proper irrigation water management, weed control, fertilization, and selecting crop varieties. Proper irrigation water management, which involves applying water at the optimum time and in appropriate amounts, reduces problems associated with overirrigation that includes loss of nutrients and short forage-stand life. Proper techniques for irrigation water management help maintain higher production levels.

Wet soils are mainly used for hay production and pasture. Garrison creeping meadow foxtail produces excellent forage under these conditions.

There is little dryland farming because of the short growing season and marginal growing-season rainfall. Irrigation is primarily by surface flooding methods. Forage production mainly supports the large number of cattle in the survey area.

Pasture and hayland areas could be improved by reestablishing desired grasses and legumes. Reestablishment is generally done by growing small grains for 1 to 2 years, then planting the area back to permanent cover for 5 to 12 years. Weed control and proper grazing insure desired plant species are maintained.

Subirrigated meadows are used for wintering cattle and for early spring grazing. These areas are primarily native grasses or Garrison creeping meadow foxtail.

Deteriorated stands may be reestablished or renovated by proper grazing, fertilization, or establishment of early season pasture.

### Yields per Acre

The average yields per acre shown in the yields table in this survey are those that can be expected of the principal crops under a high level of management. In any given year, yields may be higher or lower than those yields indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of map units in the survey area is shown in the table.

Dryland small-grain yields (spring wheat, winter wheat, oats, and barley), as presented in the certified soils database and related publications in Montana, are generated using a Crop Yield Model (MT-CYM). This model is based on Montana Agricultural Experiment Station Report 35 (AES-35). AES-35 was revised, verified, and tested to encompass all dryland-cropped soils in the state from 1990 to the present, as the MT-CYM was programmed and maintained in the NRCS soils database. The resulting model consistently generates credible yields, stored not as traditional data but generated as the soils data is certified and, subsequently, included as interpretation results.

Crop yields provided in this publication other than for dryland small grains are database stored and gathered more traditionally, through yield reporting, farmer interviews, and other yield studies.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

For yields of irrigated crops, it is assumed that the irrigation system is adapted to the soils and to the crops grown, that good-quality irrigation water is uniformly applied as needed, and that tillage is kept to a minimum.

Pasture yields are expressed in terms of animal unit months. An animal unit month (AUM) is the amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

The estimated yields reflect the productive capacity of each soil for each principal crop. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in the yields tables are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

### **Cropland Management**

Management concerns affecting the use of the detailed soil map units in the survey area for constructing grassed waterways, vegetating grassed waterways and filter strips, and installing sprinkler irrigation are shown in the "Cropland Management" table.

A *grassed waterway* is a natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. The grassed waterway conducts surface water away from cropland.

A *filter strip* is a vegetated strip typically less than 50 feet wide, seeded to grass or a mixture of grass and legumes, to remove sediment, nutrients, and bacteria, concentrated in runoff from adjacent cropland or feed lots.

*Sprinkler irrigation* is a method to apply water to soils to assist in the production of crops. A pressure system sprays water through pipes or nozzles over the soil surface.

### **Land Capability Classification**

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria

used in grouping soils do not include major and generally expensive landforming that would change slope, depth, or other soil characteristics, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, forestland, or engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit. The unit level is not utilized in Montana. More information is available from the National Soil Survey Handbook, online at <http://soils.usda.gov/technical/handbook/contents/part622.html#02>.

*Capability classes*, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have slight limitations that restrict their use. This class does not occur in Montana.

Class 2 soils have moderate limitations that restrict the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that restrict the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that restrict the choice of plants or that require very careful management, or both.

Class 5 soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 7 soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.

Class 8 soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes.

*Capability subclasses* are soil groups within one class. They are designated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, 2*e*. The letter *e* shows the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows the chief limitation is climate that is very cold or very dry.

In class 1, there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w*, *s*, or *c* because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, forestland, wildlife habitat, or recreation.

The productivity of soils and related capability class or subclass are shown in the “Land Capability and Yields per Acre of Crops and Pasture” table. The capability classification of map units in this survey area is given in the yields table.

## Prime Farmland and Other Important Farmlands

The “Prime Farmland and Other Important Farmlands” table lists the map units in the survey area that are considered prime farmland and farmland of statewide importance. This list does not constitute a recommendation for a particular land use.

## **Prime Farmland**

In an effort to identify the extent and location of important farmlands, the Natural Resources Conservation Service, in cooperation with other interested Federal, State, and local government organizations, has inventoried land that can be used for production of the Nation's food supply.

*Prime farmland* is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil quality, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. The water supply is dependable and of adequate quality. Prime farmland is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is less than frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent. Detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

A trend in land use in some areas has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated or maintained in a healthy state when cropped.

About 53,050 acres, or nearly 15 percent of the survey area, would meet the requirements for prime farmland if an adequate and dependable supply of irrigation water were available. These acres, if not irrigated, meet the criteria for farmland of statewide importance in Montana.

The extent of each listed map unit is shown in the "Acreage and Proportionate Extent of the Soils" table. The location is shown on the detailed soil maps. The soil qualities that affect use and management are described under the heading "[Detailed Soil Map Units](#)."

## **Farmland of Statewide Importance**

Some land that does not meet the criteria for prime farmland meets the criteria for farmland of statewide importance for the production of food, feed, fiber, forage, and oilseed crops. The criteria for defining and delineating farmland of statewide importance are determined by the appropriate state agencies. Generally, this land includes areas of soils that nearly meet the requirements for prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. Some areas may produce as high a yield as prime farmland if conditions are favorable.

Farmland of statewide importance is included in the list of prime farmland.

Criteria are available in the Field Office Technical Guide, Section II, which is available in local offices of the Natural Resources Conservation Service and online at <http://www.nrcs.usda.gov/technical/efotg/>.

## Range

Tamra DeCock, Rangeland Management Specialist, Natural Resources Conservation Service, prepared this section.

Approximately 30 percent of the survey area supports rangeland vegetation, and about 10 percent supports forest understory vegetation that is suitable for livestock grazing. Nearly 92 percent of the farm income in the survey area is derived from the sale of livestock, principally cattle. Cow-calf operations are the major type of livestock enterprise. The average size of a ranch in this survey area is about 578 acres.

Most grazing is on native range. On some ranches, species such as crested wheatgrass have been introduced for early spring grazing. The range is primarily used for grazing domestic livestock; however, it is also used as wildlife habitat, recreation areas, and watershed and for esthetic value.

For areas that have similar climate and topography, differences in kind and amount of vegetation produced are closely related to the kind of soil. Effective management is based on the relationship between the soils and vegetation.

Rangeland and grazeable forestland contain ecosystems that provide forage for livestock and/or wildlife, recreational opportunities, esthetic values, scenery, minerals, and wood products and serve as watersheds. Proper management is essential for the sustainable production of food and fiber, as well as supporting this diversity of other uses.

The *National Range and Pasture Handbook* (<http://www.glti.nrcs.usda.gov/technical/publications/nrph.html>) defines *rangeland* as land on which the Historic Climax Plant Community (HCPC) is predominantly grasses, grasslike plants, forbs, or shrubs. Rangeland includes lands revegetated naturally or artificially when routine management is accomplished mainly through manipulation of grazing. Rangeland includes natural grasslands, savannas, shrublands, most deserts, tundra, alpine communities, coastal marshes, and wet meadows.

*Grazeable forest understory* is defined as land on which the understory includes, as an integral part of the forest plant community, plants that can be grazed without significant impairment of other forest values.

The "Rangeland Ecological Sites and Forest Habitat Types with Production" table shows for each listed soil, the rangeland ecological site or forest habitat type along with annual production of vegetation in favorable, normal, and unfavorable years. Only those soils used as rangeland or grazeable forest understory, or suited as rangeland or grazeable forest understory, are listed. Explanation of the column headings in this table follows.

The *National Range and Pasture Handbook* defines *ecological site* as a distinctive kind of rangeland, with specific physical characteristics, that differs from other kinds of rangeland in its ability to produce a distinctive kind and amount of vegetation. Montana NRCS' Ecological Site Description (ESD) naming and numbering policy is located online at <http://www.glti.nrcs.usda.gov/technical/publications/nrph.html>.

ESDs contain information about soils, physical features, associated hydrologic features, plant communities possible on the site, plant community dynamics, annual production estimates, associated animal communities, and associated similar sites and interpretations for grazing, wildlife, watershed, recreation, and other management uses. ESDs describe the HCPC or other reference plant community for the site. ESDs are being developed for each ecological site. Approved ESDs are located at <http://esis.sc.egov.usda.gov/>.

The relationship between soils and vegetation was ascertained during this survey; thus, ecological sites are listed for components that occur in the map units, evident on the soil map. Stocking rates and management opportunities are determined by the plants and vegetative production actually growing on a specific site. This existing plant community and production is obtained by onsite investigations performed in the planning process.

Habitat type is an aggregation of all land areas capable of producing similar climax plant communities. Habitat types are considered basic ecological subdivisions of landscapes. Each habitat type is recognized by distinctive combinations of overstory and understory plant species at climax. Habitat types are named for dominant, or characteristic, vegetation of the climax community. The habitat type and phase displayed in this table is documented in *Forest Habitat Types of Montana* (Pfister et al, 1977) for coniferous forests or *Classification and Management of Montana's Riparian and Wetland Sites* (Hansen et al., 1995) for deciduous forests.

Annual production for rangeland is the amount of vegetation that can be expected to grow annually on well-managed rangeland that is supporting the HCPC. The composition and production of the plant community are determined by soil, climate, topography, and hydrology. Over time, the combination of plants best suited to a particular soil, climate, topography and hydrology results. This group of plants reflects the climax plant community for the site. The HCPC is that assemblage of plants presumed to occur on the site at the time of European immigration and settlement of North American rangelands—a healthy stable site. Natural plant communities are not static but vary slightly from year to year and place to place.

Annual production includes all vegetation, whether or not it is palatable to grazing animals. It includes the current year's growth of leaves, twigs, and fruit of woody plants up to a height of 4.5 feet. Annual production does not include increase in stem diameter of trees and shrubs.

Total annual production is expressed as the total annual yield per acre of air-dry vegetation. The relationship of green weight to air-dry weight varies according to such factors as exposure, amount of shade, recent rains, and unseasonable dry periods. Annual production in this table is expressed in pounds per acre of air-dry vegetation for favorable, normal, and unfavorable years. In a favorable year, the amount and distribution of precipitation, along with temperature, make growing conditions substantially better than average. In a normal year, growing conditions are about average. In an unfavorable year, growing conditions are well below average, generally because of low available soil moisture.

The composition and production of the plant community present on an ecological site today may vary significantly as compared to the HCPC.

Annual production for grazeable forest understory is the amount of annual production of understory plants expected under a canopy density most nearly typical of forestland in which the production of wood crops is highest. The combination of plants and vegetative production actually growing on an individual site must be determined in order to properly stock and determine viable management objectives. The quantity and quality of understory vegetation vary with the kind of soil, age and kind of trees in the canopy, density of the canopy, and depth and condition of the litter, and plant species present.

## **Rangeland Management**

According to the *National Range and Pasture Handbook* (<http://www.glti.nrcs.usda.gov/technical/publications/nrph.html>), the objective in grazing land management is to provide the kind of plant community that provides for and maintains a healthy ecosystem, produces quality forage for the grazing animals, and meets the needs of the grazing land enterprise and the desires of the landowner.

Proper grazing management generally results in the optimum production of vegetation, reduction of less desirable species, conservation of water, and control of erosion. Many times a similarity to HCPC somewhat below the potential meets grazing needs, provides wildlife habitat, and protects soil and water resources.

Rangeland landscapes are divided into ecological sites for the purposes of inventory, evaluation, and management. An ecological site is recognized and described based on the characteristics differentiating it from other sites in its ability to produce



and support a characteristic plant community Rangeland management requires knowledge of ecological sites and of the HCPC. The composition and production of the plant community present on an ecological site today may vary significantly as compared to the HCPC.

Disturbances that alter the natural plant community include repeated overuse by livestock, excessive burning, erosion, and plowing. Grazing animals select the most palatable plants within a community. These plants will eventually die if they are continually overgrazed. A severe disturbance can destroy the natural community. Under these conditions, less desirable plants, such as annuals and weeds, can invade. If the plant community has not deteriorated significantly and proper grazing management is applied, it can eventually return to dominantly natural plants.

Knowledge of ecological sites and associated HCPCs is necessary as a basis for planning and applying the management needed to maintain or improve the desired plant community. Such information is needed to determine management objectives, proper grazing systems and stocking rates, suitable wildlife management practices, potential for recreational uses, and condition of watersheds.

Grazing management is the most important part of any rangeland management program. The key elements of grazing management are to manage kind of animals, number of animals, grazing distribution, length of grazing periods, and timing of use. The goal is to provide sufficient deferment from grazing during the growing season to maintain or improve the plant community.

Special consideration is often required for sensitive areas, such as riparian areas, wetlands, and habitats of concern, in order to manage grazing and maintain adequate cover. Misuse of sensitive areas may result in deterioration of protective vegetation, reduction of streambank stability, and excessive erosion. Developing off-stream watering locations can successfully prevent cattle from overgrazing riparian areas and encourage better livestock distribution.

Certain practices commonly are needed to obtain a uniform distribution of grazing. These practices include developing livestock watering facilities, fencing, properly locating salt and mineral supplements, constructing livestock trails in steeply sloping areas, and riding or herding.

Various kinds of grazing systems can be used in range management. No single grazing system is best under all conditions. The grazing system should increase the quantity and quality of range vegetation; meet operators' needs; and be designed according to topography, type of grazing animals, and resource management objectives.

Accelerating practices are applicable in areas where management practices alone do not achieve the desired results in a timely fashion. These practices include range seeding, brush management, weed control, prescribed burning, and mechanical treatment. Accelerating practices can be effective only when used in combination with a management system to help maintain the desired plant community.

Some soils are suited to mechanical treatment for range improvement. On other soils, however, mechanical treatment is not recommended. The "Agronomy" section defines capability classes. Capability classes are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. Many soils in capability classes 1 through 4 are suited to such practices as seeding, mechanical brush and weed control, and water spreading. Soils in capability classes 5, 6, 7, or 8 have greater, and, in some cases, insurmountable limitations. Many soils in capability classes 1 through 4 are suited to tillage for seedbed preparation before native or introduced forage plant species are seeded. Soils in capability class 6 may be suited to limited surface disturbance, such as scarification for seeding and as a means of increasing the rate of water infiltration for seed germination.

### **Grazeable Forest Understory Management**

Understory vegetation consists of grasses, forbs, shrubs, and other plants. If well managed, some forestland can produce enough understory vegetation to support grazing of livestock or wildlife, or both, without damage to the overstory community.

Forest understory production can usually be improved by reducing canopy density when combined with managing grazing stocking rates, livestock distribution, and season of use. Often both woodland and range resources benefit from thinning the overstory to canopy levels that optimize both timber and forage production. Broadcast seeding of disturbed areas soon after timber harvest with desirable range forage species can improve vegetation quantity and quality while reducing the chance of undesirable plants occupying the site.

Steepness of slopes and distance to drinking water are severe grazing management problems in many mountain and foothill areas. Variations in primary season of plant growth, production levels, and plant communities because of elevation and aspect changes present additional challenges. Long, steep slopes limit access by livestock. Less sloping areas are subject to overuse. Grazing should be delayed until the soil is firm enough to withstand trampling and plants have matured enough to withstand grazing pressure.

Habitat type variations as they occur on the landscape illustrate the combined effect of aspect, slope, elevation, and soil properties on potential plant growth.

### **Forestland**

Robert Logar, State Forester, Natural Resources Conservation Service, prepared this section.

Approximately 21 percent or about 67,880 acres of the survey area is forested (Chojnacky, 1991; acreage table in Silver Bow County Area and Parts of Beaverhead and Jefferson Counties, Montana, soil survey, 2009). Of this acreage, the commercial forestland is producing about 46 cubic feet per acre per year and about 102 board feet (Scribner's log rule) per acre per year growth (MT DNRC, 1984). In 1989, net volume of sawtimber within the survey area was estimated to be approximately 258,249,000 board feet, 95 percent of which is softwood timber (Conner, 1993; MT DNRC, 1984). Most of the estimated timber volume is on private land (78%) (MT DNRC, 1984). Harvesting of the timber resource has increased over the years. Sawtimber, pulpwood, and post and poles have been removed. Approximately 2,421,000 board feet of sawtimber is removed annually on nonindustrial private forestland (Conner, 1993). Net annual growth of sawtimber is about 6,784,000 board feet (Chojnacky, 1991). The area has an average annual mortality of about 1,083,000 board feet of sawtimber (Chojnacky, 1991). The mortality rate is increasing greatly due to mountain pine beetle attacks on lodgepole pine stands, facilitated by drought stress.

The Montana Department of Natural Resources and Conservation-Forestry Division and local fire districts provide fire protection for forestland within the soil survey area.

Soils vary in their ability to support the growth of trees. Soil depth, fertility, texture, and available water-holding capacity influence tree growth. Aspect, soils, and climate determine the kinds of trees that can be expected on any site and their growth rate. Forested areas range in elevation from about 5,000 feet, along the Little Pipestone Creek drainage, to 7,000 feet, along the Continental Divide near Elk Park Pass. The forested soils in the soil survey area range from shallow to very deep, from nongravelly to extremely gravelly, and from fine textured to coarse textured. Because of variability among the soils, as well as differences in climate, topography, and geology, the forests differ in composition and productivity.



## Silver Bow County Area and Parts of Beaverhead and Jefferson Counties, Montana

The three dominant forest cover types in Silver Bow County, outside the national forest, are:

Douglas fir (60%)  
Lodgepole pine (16%)  
Spruce-subalpine fir (19%)

Cover types of whitebark-limber pine, quaking aspen, Rocky Mountain juniper, and black cottonwood occupy lesser acreage (MT DNRC, 1984).

The major part of the coniferous forestland within the soil survey area can be divided into three general areas:

Flint Creek drainage area  
Moose Creek drainage area  
Continental Divide along Elk Park Pass

The Flint Creek drainage area is predominantly a Douglas-fir cover type with smaller areas of lodgepole pine. The area is typically within the 20- to 24-inch precipitation zone. The forest understory plant community is dominated by common snowberry, pinegrass, elk sedge, mallow ninebark, and Idaho fescue. In areas receiving greater than 24 inches of precipitation, Engelmann spruce and subalpine fir cover types occur. In this higher precipitation zone, blue huckleberry, grouse whortleberry, common snowberry, and pinegrass dominate the understory vegetation. Limber pine dominates forested areas receiving 15 to 19 inches of precipitation. The soils are primarily steep, shallow to very deep, with some rock outcrop. Limestone, gneiss, schist, and interbedded sandstone and shale bedrock, as well as moraine and landslide deposits, influence the soils in the area.

The Moose Creek drainage area has varying degrees of stand density. The area is occupied by a Douglas-fir cover type with smaller areas of lodgepole pine. The area is typically within the 20- to 24-inch precipitation zone and has dominantly shallow to moderately deep soils with some rock outcrop. The associated forest understory plant community varies with precipitation, steepness of slope, aspect, overstory tree canopy density, and soils. Understory plants commonly occurring in this area are common snowberry, pinegrass, elk sedge, mallow ninebark, and Idaho fescue. In areas receiving greater than 24 inches of precipitation, Engelmann spruce and subalpine fir cover types occur with blue huckleberry, grouse whortleberry, common snowberry, and pinegrass dominating the understory vegetation. Limber pine dominates forested areas receiving 15- to 19-inches of precipitation. Soils in this area are influenced by alternating beds of relatively hard sandstone and softer shale at lower elevations and, at higher elevations, limestone and dolomite bedrock and landslide deposits.

The Continental Divide along Elk Park Pass is occupied by a Douglas-fir cover type with smaller areas of lodgepole pine. Precipitation typically ranges from 20 to 24 inches. Forest understory plant communities are dominated by common snowberry, pinegrass, elk sedge, mallow ninebark, and Idaho fescue. In areas receiving greater than 24 inches of precipitation, Engelmann spruce, subalpine fir and whitebark pine cover types occur with blue huckleberry, grouse whortleberry, common snowberry, and pinegrass dominating the understory vegetation. Limber pine dominates forested areas receiving 15- to 19-inches of precipitation.

Quaking aspen is found in wet areas throughout the soil survey area. The soils in these areas have moderate to high available water-holding capacity and are located in positions that receive extra moisture. The forest understory plant community is dominated by redosier dogwood, common snowberry, Kentucky bluegrass, and rose.

The valley bottoms, where forested, have deciduous tree species. The major part of the deciduous forestland is found along the valleys of the Big Hole River, Divide Creek,

and Silver Bow Creek. These areas have soils that formed in alluvial material with rare to occasional flooding. The narrowleaf cottonwood cover type typifies areas along the Divide Creek and Silver Bow Creek drainages having a 10- to 14-inch precipitation zone. Associated plant communities are dominated by common snowberry, redosier dogwood, and rose.

Black cottonwood grows along the Big Hole River. This area falls within the 15- to 19-inch precipitation zone. Associated plant communities are dominated by common snowberry, redosier dogwood, and rose.

### **Forestland Management and Productivity**

The tables described in this section can help forest owners or managers plan the use of soils for wood crops. They show the potential forest productivity of the soils and rate the soils according to limitations affecting various aspects of forestland management.

Soil components impacted as a result of mining activities are listed as “not rated, impacted” for affected map units in forest interpretation tables where there is a high probability that these activities could result in people coming into significant contact with surface soil material.

### **Forestland Management**

In these tables, interpretive ratings are given for various aspects of forestland management. Ratings in the tables are in both text and numerical format.

Some rating class terms indicate the degree to which the soils are suited to a specified aspect of forestland management. *Well suited* indicates the soil has features favorable for the specified management aspect and has no limitations. Good performance can be expected, and little or no maintenance is needed. *Moderately suited* indicates the soil has features moderately favorable for the specified management aspect. One or more soil properties are less than desirable, and fair performance can be expected. Some maintenance is needed. *Poorly suited* indicates the soil has one or more properties unfavorable for the specified management aspect. Overcoming unfavorable properties requires special design, extra maintenance, and costly alteration. *Unsuited* indicates expected performance of the soil is unacceptable for the specified management aspect or that extreme measures are needed to overcome undesirable soil properties.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified aspect of forestland management (1.00) and the point at which the soil feature is not a limitation (0.00).

The paragraphs that follow indicate soil properties considered in rating the soils. Detailed information about criteria used in the ratings can be found in the *National Forestry Manual*, which is available in local offices of the Natural Resources Conservation Service or on the Internet (<http://soils.usda.gov/technical/nfmanual/>).

The “Haul Roads, Log Landings, and Seedling Mortality on Forestland” table shows interpretive ratings related to limitations affecting construction of haul roads and log landings, suitability for log landings, and potential for seedling mortality.

For *limitations affecting construction of haul roads and log landings*, ratings are based on slope, flooding, permafrost, plasticity index, hazard of soil slippage, content of sand, Unified classification, rock fragments on or below the surface, depth to a restrictive layer that is indurated, depth to a water table, and ponding. The limitations are described as slight, moderate, or severe. A rating of *slight* indicates no significant limitations affect construction activities; *moderate* indicates one or more limitations can cause some difficulty in construction; and *severe* indicates one or more limitations can make construction very difficult or very costly.

The ratings of *suitability for log landings* are based on slope, rock fragments on the surface, plasticity index, content of sand, Unified classification, depth to a water table, ponding, flooding, and hazard of soil slippage. The soils are described as well suited, moderately suited, or poorly suited for use as log landings.

Ratings in the column *susceptibility to seedling mortality* are based on flooding, ponding, depth to a water table, content of lime, reaction, salinity, available water capacity, soil moisture regime, soil temperature regime, aspect, and slope. The soils are described as having a low, moderate, or high susceptibility to seedling mortality. Where these terms are used, the numerical ratings indicate gradations between the point where susceptibility is highest (1.00) and the point where susceptibility is lowest (0.00).

The “Forestland Planting and Harvesting” table shows interpretive ratings related to suitability for hand planting, suitability for mechanical planting, and suitability for use of harvesting equipment.

Ratings in the columns *suitability for hand planting* and *suitability for mechanical planting* are based on slope, depth to a restrictive layer, content of sand, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, moderately suited, poorly suited, or unsuited to these methods of planting. It is assumed necessary site preparation is completed before seedlings are planted.

Ratings in the column *suitability for use of harvesting equipment* are based on slope, rock fragments on the surface, plasticity index, content of sand, Unified classification, depth to a water table, and ponding. The soils are described as well suited, moderately suited, or poorly suited to this use.

The “Forestland Site Preparation” table shows interpretive ratings related to suitability for mechanical site preparation (surface) and suitability for mechanical site preparation (deep).

Ratings in the column *suitability for mechanical site preparation (surface)* are based on slope, depth to a restrictive layer, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, poorly suited, or unsuited to this management activity. The part of the soil from the surface to a depth of about 1 foot is considered in the ratings.

Ratings in the column *suitability for mechanical site preparation (deep)* are based on slope, depth to a restrictive layer, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, poorly suited, or unsuited to this management activity. The part of the soil from the surface to a depth of about 3 feet is considered in the ratings.

### **Forestland Productivity**

In the “Forestland Productivity” table, the *potential productivity* of merchantable or *common trees* on a soil is expressed as a site index and as a volume number.

*Common trees* are those that forest managers generally favor in intermediate or improvement cuttings. They are selected based on growth rate, quality, value, and marketability.

The *site index* is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. The specified number of years (base age) may be different for different species. The site index base age is 30 years for narrowleaf cottonwood (locally adapted site index curves developed by NRCS); 50 years for black cottonwood (Sauerwein, 1979), Douglas-fir (Brickell, 1968), and Engelmann spruce; 80 years for quaking aspen (Baker, 1925); and 100 years for lodgepole pine (Alexander, 1966). Therefore, site index values are not directly comparable from one species to another.

Detailed information regarding site index is available in the *National Forestry Manual*, which is available in local offices of the Natural Resources Conservation Service or on the Internet (<http://soils.usda.gov/technical/nfmanual/>).

The *volume of wood fiber*, a number, is the yield likely to be produced by the most important tree species. This number, expressed as cubic feet per acre per year and calculated at the age of culmination of the mean annual increment (CMAI), indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand. These volume numbers are comparable between tree species on a site, or between sites.

Board-foot volumes used to estimate the board foot yields of lodgepole pine (Myers, 1967) are based on Scribner's log rule. Board-foot volumes include all trees larger than 10 inches in diameter breast height to an 8-inch top diameter inside bark. Total cubic foot yield estimates (inside bark) are based on all trees with diameter breast height inside the bark of more than one inch (Dahms, 1964). Total cubic-foot volume estimates for quaking aspen yields are based on all trees with more than 4 inches diameter breast height (Baker, 1925). Narrowleaf and black cottonwood yields are based on data collected by NRCS.

*Suggested trees to plant* are those preferred for planting, seeding, or natural regeneration and those that remain in the stand after thinning or partial harvest.

## Recreation

Soil components impacted as a result of mining activities are listed as "not rated, impacted" for affected map units in recreation interpretation tables where there is a high probability these activities could result in people coming into significant contact with surface soil material.

In the table described in this section, the soils of the survey area are rated according to limitations that affect their suitability for recreational development. Ratings in the table are in both text and numerical format. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the recreational uses. *Not limited* indicates the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The ratings in the tables are based on restrictive soil features, such as wetness, slope, texture of the surface layer, and susceptibility to flooding. Not considered in the ratings, but important in evaluating a site, are the area's location and accessibility, size and shape, and scenic quality; vegetation; access to water and public sewer lines; and potential water impoundment sites. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation also are important. Soils subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of depth, duration, intensity, and frequency of flooding is essential.

The information in the "Camp Areas, Paths and Trails, and Off-road Vehicle Trails" table can be supplemented by other information in this survey, for example, interpretations for building site development and construction material potential.

*Camp areas* require site preparation, such as shaping and leveling tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The ratings are based on soil properties that affect the ease of developing camp areas and the performance of the areas after development. Slope, stoniness, and depth to bedrock or a cemented pan are the main concerns affecting the development of camp areas. Soil properties that affect performance of the areas after development are those that influence trafficability and promote growth of vegetation, especially in heavily used areas. For good trafficability, the surface of camp areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

*Paths and trails* for hiking and horseback riding should require little or no slope modification through cutting and filling. The ratings are based on soil properties that affect trafficability and erodibility. These properties are stoniness, depth to a water table, ponding, flooding, slope, and texture of the surface layer.

*Off-road vehicle trails* require little or no site preparation. They are not covered with surfacing material or vegetation. Considerable compaction of the soil material is likely. The ratings are based on the soil properties that influence erodibility, trafficability, dustiness, and the ease of revegetation. These properties are stoniness, slope, depth to a water table, ponding, flooding, and texture of the surface layer.

## Engineering

This section provides information for planning land uses related to urban development and water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, construction materials, and water management. The ratings are based on observed performance of the soils and on the data in the tables described under the heading [“Soil Properties.”](#)

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to soil between the surface and a depth of 5 to 7 feet. Because of map scale, small areas of different soils may be included within mapped areas of a specific soil.

*The information is not site specific and does not eliminate the need for onsite investigation of soils or for testing and analysis by personnel experienced in design and construction of engineering works.*

*Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, site selection, and design.*

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the soil survey fieldwork, determinations were made about particle-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 7 feet of the surface, soil wetness, depth to a water table, ponding, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, reclamation material, roadfill, and topsoil; plan structures for water management; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

Information in the tables, along with the soil maps, soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some terms used in this soil survey have a special meaning in soil science; these terms are defined in the [“Glossary.”](#)

### **Building Site Development**

Soil properties influence the development of building sites, including selection of the site, design of the structure, construction, performance after construction, and maintenance. The “Building Site Development” table shows the degree and kind of soil limitations that affect septic tank absorption fields, dwellings with basements, and small commercial buildings.

Ratings in the table are in both text and numerical format. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. *Not limited* indicates the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

*Septic tank absorption fields* are areas where effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only soil between depths of 24 and 60 inches is evaluated. The ratings are based on soil properties that affect absorption of the effluent, system construction and maintenance, and public health. Permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of effluent. Stones and boulders, ice, bedrock, or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of effluent in downslope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils, the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

*Dwellings* are single-family houses of three stories or less. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on soil properties that affect the capacity of the soil to support a load without movement and on properties that affect excavation and construction costs. Properties that affect load-supporting capacity include depth to a water table, ponding,

flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. Properties that affect ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and amount and size of rock fragments.

*Small commercial buildings* are structures less than three stories high, without basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on soil properties that affect the capacity of the soil to support a load without movement and on properties that affect excavation and construction costs. Properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (inferred from the Unified classification). Properties that affect ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

### **Agricultural Waste Management**

Soil properties are important considerations in areas where soils are used as sites for treatment and disposal of organic waste and wastewater. Selection of soils with properties that favor waste management can help to prevent environmental damage.

The tables described in this section show the degree and kind of soil limitations affecting treatment of agricultural waste, including municipal and food-processing wastewater and effluent from lagoons or storage ponds. Municipal wastewater is the waste stream from a municipality. It contains domestic waste and may contain industrial waste. It may have received primary or secondary treatment. It is rarely untreated sewage. In the context of these tables, effluent in lagoons and storage ponds is from facilities used to treat or store food-processing wastewater or domestic or animal waste. Food-processing wastewater results from preparation of fruits, vegetables, milk, cheese, and meats for public consumption. In places, it is high in content of sodium and chloride. Domestic and food-processing wastewater is very dilute, and effluent from facilities that treat or store it commonly is very low in content of carbonaceous and nitrogenous material; content of nitrogen commonly ranges from 10 to 30 milligrams per liter. Wastewater from animal waste treatment lagoons or storage ponds, however, has much higher concentrations of these materials, mainly because the manure has not been diluted as much as the domestic waste. The content of nitrogen in this wastewater generally ranges from 50 to 2,000 milligrams per liter. When wastewater is applied, checks should be made to ensure that nitrogen, heavy metals, and salts are not added in excessive amounts.

The ratings in the tables are for waste management systems that not only dispose of and treat organic waste or wastewater but also are beneficial to crops (application of manure and food-processing, application of sewage sludge, and disposal of wastewater by irrigation) and for waste management systems designed only for the purpose of wastewater disposal and treatment (overland flow of wastewater, rapid infiltration of wastewater, and slow rate treatment of wastewater).

The ratings in the tables are in both text and numerical format. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect agricultural waste management. *Not limited* indicates the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates the soil has features that are moderately favorable for the specified use. Limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil

reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The “Agricultural Disposal of Manure, Food-Processing Waste, and Sewage Sludge” table shows interpretive ratings related to application of manure, food-processing waste, and sewage sludge.

*Application of manure and food-processing waste* not only disposes of waste material but also can improve crop production by increasing the supply of nutrients in soils where the material is applied. Manure is excrement of livestock and poultry, and food-processing waste is damaged fruit and vegetables and the peelings, stems, leaves, pits, and soil particles removed in food preparation. Manure and food-processing waste are a solid, slurry, or liquid. Their nitrogen content varies. A high content of nitrogen limits the application rate. Toxic or otherwise dangerous wastes, such as those mixed with lye used in food processing, are not considered in the ratings.

The ratings are based on soil properties that affect absorption, plant growth, microbial activity, erodibility, the rate at which waste is applied, and the method by which waste is applied. Properties that affect absorption include permeability, depth to a water table, ponding, sodium adsorption ratio, depth to bedrock or a cemented pan, and available water capacity. Properties that affect plant growth and microbial activity include reaction, sodium adsorption ratio, salinity, and bulk density. Wind erodibility group, soil erodibility K factor, and slope are considered in estimating the likelihood that wind erosion or water erosion will transport waste material from the application site. Stones, cobbles, a water table, ponding, and flooding can hinder waste application. Permanently frozen soils are unsuitable for waste treatment.

*Application of sewage sludge* not only disposes of waste material but also can improve crop production by increasing the supply of nutrients in soils where the material is applied. In the context of this table, sewage sludge is the residual product of the treatment of municipal sewage. The solid component consists mainly of cell mass, primarily bacteria cells that developed during secondary treatment and have incorporated soluble organics into their own bodies. The sludge has small amounts of sand, silt, and other solid debris. Nitrogen content varies. Some sludge has constituents toxic to plants or hazardous to the food chain, such as heavy metals and exotic organic compounds, and should be analyzed chemically prior to use.

The content of water in sludge ranges from about 98 percent to less than 40 percent. The sludge is considered liquid if it is more than about 90 percent water, slurry if it is 50 to 90 percent water, and solid if it is less than 50 percent water.

The ratings in the table are based on soil properties that affect absorption, plant growth, microbial activity, erodibility, the rate at which sludge is applied, and the method by which sludge is applied. Properties that affect absorption, plant growth, and microbial activity include permeability, depth to a water table, ponding, sodium adsorption ratio, depth to bedrock or a cemented pan, available water capacity, reaction, salinity, and bulk density. Wind erodibility group, soil erodibility K factor, and slope are considered in estimating the likelihood that wind erosion or water erosion will transport waste material from the application site. Stones, cobbles, a water table, ponding, and flooding can hinder sludge application. Permanently frozen soils are unsuitable for waste treatment.

The “Agricultural Disposal of Wastewater by Irrigation and Overland Flow” table shows interpretive ratings related to disposal of wastewater by irrigation and disposal of wastewater by overland flow.

*Disposal of wastewater by irrigation* not only disposes of municipal wastewater and wastewater from food-processing plants, lagoons, and storage ponds but also



can improve crop production by increasing the amount of water available to crops. The ratings in the table are based on soil properties that affect design, construction, management, and performance of the irrigation system. Properties that affect design and management include sodium adsorption ratio, depth to a water table, ponding, available water capacity, permeability, slope, and flooding. Properties that affect construction include stones, cobbles, depth to bedrock or a cemented pan, depth to a water table, and ponding. Properties that affect performance include depth to bedrock or a cemented pan, bulk density, sodium adsorption ratio, salinity, reaction, and cation-exchange capacity, which is used to estimate the capacity of a soil to adsorb heavy metals. Permanently frozen soils are not suitable for disposal of wastewater by irrigation.

*Disposal of wastewater by overland flow* is a process where wastewater is applied to the upper reaches of sloped land and allowed to flow across vegetated surfaces, sometimes called terraces, to runoff-collection ditches. The length of the run generally is 150 to 300 feet. The application rate ranges from 2.5 to 16.0 inches per week. It commonly exceeds the rate needed for irrigation of cropland. The wastewater leaves a thin film of solids and nutrients on the vegetated surfaces as it flows downslope. Most of the water reaches the collection ditch, some is lost through evapotranspiration, and a small amount may percolate to the ground water.

The ratings in the table are based on soil properties that affect absorption, plant growth, microbial activity, and the design and construction of the system. Reaction and cation-exchange capacity affect absorption. Reaction, salinity, and sodium adsorption ratio affect plant growth and microbial activity. Slope, permeability, depth to a water table, ponding, flooding, depth to bedrock or a cemented pan, stones, and cobbles affect design and construction. Permanently frozen soils are unsuitable for waste treatment.

The “Agricultural Disposal of Wastewater by Rapid Infiltration and Slow Rate Treatment” table shows interpretive ratings related to rapid infiltration of wastewater and slow rate treatment of wastewater.

*Rapid infiltration of wastewater* is a process where wastewater applied in a level basin at a rate of 4 to 120 inches per week percolates through the soil. The wastewater may eventually reach the ground water. The application rate commonly far exceeds the rate needed for irrigation of cropland. Vegetation is not a necessary part of the treatment; hence, basins may or may not be vegetated. The thickness of the soil material needed for proper treatment of wastewater is more than 72 inches. As a result, geologic and hydrologic investigation is needed to ensure proper design and performance and to determine the risk of ground-water pollution.

The ratings in the table are based on soil properties that affect risk of pollution and design, construction, and performance of the system. Depth to a water table, ponding, flooding, and depth to bedrock or a cemented pan affect the risk of pollution and the design and construction of the system. Slope, stones, and cobbles also affect design and construction. Permeability and reaction affect performance. Permanently frozen soils are unsuitable for waste treatment.

*Slow rate treatment of wastewater* is a process in which wastewater is applied to land at a rate normally between 0.5 inch and 4.0 inches per week. The application rate commonly exceeds the rate needed for irrigation of cropland. The applied wastewater is treated as it moves through the soil. Much of the treated water may percolate to the ground water, and some enters the atmosphere through evapotranspiration. The applied water generally is not allowed to run off the surface. Waterlogging is prevented through either control of the application rate or by using tile drains, or both.

The ratings in the table are based on soil properties that affect absorption, plant growth, microbial activity, erodibility, and waste application. Properties that affect absorption include sodium adsorption ratio, depth to a water table, ponding, available water capacity, permeability, depth to bedrock or a cemented pan, reaction, cation-

exchange capacity, and slope. Reaction, the sodium adsorption ratio, salinity, and bulk density affect plant growth and microbial activity. Wind erodibility group, soil erodibility K factor, and slope are considered in estimating the likelihood of wind erosion or water erosion. Stones, cobbles, a water table, ponding, and flooding can hinder waste application. Permanently frozen soils are unsuitable for waste treatment.

### Construction Materials

The Construction Materials tables include "Construction Material Potential" and "Potential Source of Reclamation Material, Roadfill, and Topsoil." These tables give information about soils as potential sources of gravel and sand, reclamation material, roadfill, and topsoil. Normal compaction, minor processing, and other standard construction practices are assumed.

*Gravel* and *sand* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In the Construction Materials tables, only the likelihood of finding material in suitable quantity is evaluated. The suitability of material for specific purposes is not evaluated, nor are factors that affect excavation of the material. Properties used to evaluate the soil as a source of gravel or sand are gradation of grain sizes (as indicated by the Unified classification of the soil), thickness of suitable material, and content of rock fragments. If the bottom layer of soil contains gravel or sand, the soil is considered a likely source regardless of thickness. The assumption is that the gravel or sand layer below the depth of observation exceeds the minimum thickness.

The soils are rated *good*, *fair*, or *poor* as potential sources of gravel and sand. A rating of *good* or *fair* means that the source material is likely to be in or below the soil. The bottom layer and the thickest layer of the soils are assigned numerical ratings. These ratings indicate the likelihood that the layer is a source of gravel or sand. The number 0.00 indicates that the layer is a poor source. The number 1.00 indicates that the layer is a good source. A number between 0.00 and 1.00 indicates the degree to which the layer is a likely source.

The soils are rated *good*, *fair*, or *poor* as potential sources of reclamation material and roadfill. The features that limit the soils as sources of these materials are specified in the tables. The numerical ratings given after the specified features indicate the degree to which the features limit the soils as sources of reclamation material, roadfill, and topsoil. The lower the number is, the lesser the potential is.

*Reclamation material* is used in areas that have been drastically disturbed by surface mining or similar activities. When these areas are reclaimed, layers of soil material or unconsolidated geological material, or both, are replaced in a vertical sequence. The reconstructed soil favors plant growth. Ratings in the table do not apply to quarries and other mined areas that require an offsite source of reconstruction material. The ratings are based on soil properties that affect erosion and surface stability, and the productive potential of the reconstructed soil. These properties include content of sodium, salts, and calcium carbonate; reaction; available water capacity; erodibility; texture; content of rock fragments; and content of organic matter and other features that affect fertility.

*Roadfill* is soil material that is excavated in one place and used in road embankments elsewhere. In this table, soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the whole soil, from the surface to a depth of about 5 feet. It is assumed soil layers will be mixed when soil material is excavated and spread.

The ratings are based on the amount of suitable material and on soil properties that affect the ease of excavation and performance of the material after it is in place. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a water table, and slope. How well the soil performs

in place after it has been compacted and drained is determined by its strength (as inferred from the American Association of State Highway and Transportation Officials (AASHTO) classification of the soil) and linear extensibility (shrink-swell potential) (AASHTO, 2000).

Soil components impacted as a result of mining activities are listed as “not rated, impacted” for affected map units in the column *potential source of topsoil* where there is a high probability that people could come into significant contact with surface soil material.

*Topsoil* is used to cover an area so vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area. Ratings are based on the soil properties that affect plant growth; ease of excavating, loading, and spreading material; and reclamation of the borrow area. Toxic substances, soil reaction, and properties inferred from soil texture, such as available water capacity and fertility, affect plant growth. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, depth to bedrock or a cemented pan, and toxic material.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases absorption and retention of moisture and nutrients for plant growth.

### **Water Management**

The “Ponds and Embankments” table gives information on soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. Ratings in the table are in both text and numerical format. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

*Pond reservoir areas* hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect storage capacity of the reservoir area.

*Embankments, dikes, and levees* are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. Embankments with zoned construction (core and shell) are not considered. In this table, soils are rated as a source of material for embankment fill. Ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

*Aquifer-fed excavated ponds* are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of water as inferred from the salinity of the soil. Depth to bedrock and content of large stones affect the ease of excavation.

# Soil Properties

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Data relating to soil properties are collected during the course of the soil survey.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many typically 2-meter deep excavations are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine particle-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties are shown in tables. They include engineering index properties, physical and chemical properties, and pertinent soil and water features.

## Engineering Index Properties

The “Engineering Index Properties” table described in this section gives the engineering classifications and the range of engineering properties for the layers of each soil in the survey area.

*Depth* to the upper and lower boundaries of each layer is indicated.

*Texture* is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. “Loam,” for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, “gravelly.” Textural terms are defined in the [“Glossary.”](#)

*Classification* (engineering) of the soils is determined according to the Unified soil classification system (ASTM, 2001) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2000).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

*Fragments* larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

*Percentage (of soil particles) passing sieve number* is the percentage of the soil fraction less than 3 inches in diameter based on an oven-dry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

*Liquid limit* and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

## Physical Properties

The "Physical Properties of the Soils" table shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

*Depth* to the upper and lower boundaries of each layer is indicated.

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

*Clay* as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In the table, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil taxonomic and engineering classification.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

*Moist bulk density* is the weight of soil (oven-dry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at  $\frac{1}{3}$ - or  $\frac{1}{10}$ -bar (33 kPa or 10 kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute linear extensibility, shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

*Saturated hydraulic conductivity ( $K_{sat}$ )* refers to the ease with which pores in a saturated soil transmit water. The estimates in the table are expressed in terms of in micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity ( $K_{sat}$ ) is considered in the design of soil drainage systems and septic tank absorption fields.

*Available water capacity* refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water

per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at  $\frac{1}{3}$ - or  $\frac{1}{10}$ -bar tension (33- or 10-kPa) moisture tension and oven dryness. The volume change is reported in the table as percent change for the whole soil. Volume change is influenced by the amount and type of clay minerals in the soil.

Linear extensibility is used to determine the *shrink-swell potential* of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

*Organic matter* is the plant and animal residue in the soil at various stages of decomposition. In the table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

*Erosion factors* are shown in the table as the K factor ( $K_w$  and  $K_r$ ) and the T factor. Erosion K factor indicates the susceptibility of a soil to sheet and rill erosion by water. K Factor is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and permeability. Values for K range from 0.02 to 0.69. Other factors being equal, the higher the K factor, the more susceptible the soil is to sheet and rill erosion by water.

*Erosion factor  $K_w$*  indicates the erodibility of the whole soil. The estimates include the presence of rock fragments.

*Erosion factor  $K_r$*  indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

*Erosion factor T* is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

*Wind erodibility groups* are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are described in the *National Soil Survey Handbook*, which is available in local offices of the Natural Resources Conservation Service or on the Internet (<http://soils.usda.gov/technical/handbook/>).

*Wind erodibility index* is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and calcium carbonate content. Soil moisture and frozen soil conditions also influence wind erosion.

## Chemical Properties

The “Chemical Properties of the Soils” table shows estimates of some chemical characteristics and features that affect soil behavior. These estimates are given for the

layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

*Depth* to the upper and lower boundaries of each layer is indicated.

*Cation-exchange capacity* is the total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation-exchange capacity retain fewer cations, resulting in lower inherent fertility than soils having a high cation-exchange capacity.

*Effective cation-exchange capacity* refers to the sum of exchangeable cations plus aluminum expressed in terms of milliequivalents per 100 grams of soil. It is determined for soils that have pH of less than 5.5.

*Soil reaction* is a measure of acidity or alkalinity. The pH of each soil horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating fertility requirements, and in determining the risk of corrosion.

*Calcium-carbonate* equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the elevated pH values that result from carbonates in the soil.

*Gypsum* is expressed as a percent, by weight, of hydrated calcium sulfates in the fraction of the soil less than 20 millimeters in size. Gypsum is partially soluble in water. Soils that have a high content of gypsum may collapse if the gypsum is removed by percolating water.

*Salinity* is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C (77 degrees F). Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the management of water application. Hence, the salinity of soils in individual fields can vary from the value given in the table. Salinity affects the suitability of a soil for crop production, revegetation, and the potential of the soil to corrode metal and concrete.

*Sodium adsorption ratio* (SAR) is a measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration. Soils that have SAR values of 13 or more may be characterized by an increased dispersion of organic matter and clay particles, reduced permeability and aeration, increased pH values, and a general degradation of soil structure.

## Water Features

The "Water Features" table gives estimates of various water features. The estimates are used in land use planning that involves engineering considerations.

*Hydrologic soil groups* are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well-drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or



soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

The *months* in the table indicate the portion of the year in which the feature is most likely to be a concern.

*Water table* refers to a saturated zone in the soil. The table indicates, by month, depth to the top (*upper limit*) and base (*lower limit*) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redox features) in the soil.

*Ponding* is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. The table indicates *surface water depth* and the *duration* and *frequency* of ponding.

Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

*Flooding* is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

*Duration* and *frequency* are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to less than 2 days, *brief* if 2 to less than 7 days, *long* if 7 to less than 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is more than 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based in part on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development. Also considered is local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods.

Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

## Soil Features

The “Soil Features” table gives estimates of various soil features. The estimates are used in land use planning.

*Restrictions* are nearly continuous layers that have one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the hardness and thickness of the restrictive layer, both of which significantly affect the ease of excavation. *Depth* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

*Subsidence* is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence generally results from either desiccation and shrinkage or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. The table shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which results from a combination of factors.

*Potential for frost action* is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength cause damage to pavements and other rigid structures during periods of thawing.

*Risk of corrosion* pertains to potential soil-related electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is relative to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion.

For uncoated steel and concrete, the risk of corrosion is expressed as *low*, *moderate*, or *high*.

# Classification of the Soils

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The system of soil classification used by the National Cooperative Soil Survey has six categories (Soil Survey Staff, 1999 and 2003). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. The categories are defined in the following paragraphs.

**ORDER.** Twelve soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Mollisol, from mollis, meaning soft.

**SUBORDER.** Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Cryolls (*Cry*, meaning soil with a cryic temperature regime, plus *olls*, from Mollisols).

**GREAT GROUP.** Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; type of saturation; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Argicryolls (*Argi*, meaning soils with an argillic horizon, plus *cryolls*, the suborder of the Mollisols that has a cryic temperature regime).

**SUBGROUP.** Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic subgroup is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. An example is Ustic Argicryolls.

**FAMILY.** Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineralogy class, cation-exchange activity class, soil temperature regime, soil depth, and reaction class. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is loamy-skeletal, mixed, superactive Ustic Argicryolls.

**SERIES.** The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. An example is the Adel series. The soils in the Adel series are fine-loamy, mixed, superactive Pachic Haplocryolls.

The "Taxonomic Classification of the Soils" table indicates the order, suborder, great group, subgroup, and family of the soil series in the survey area.

## Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is included. A pedon description of a three-dimensional area of soil, that is typical of the series in the survey area is provided. The detailed description of each soil horizon follows standards in the *Soil Survey Manual* (Soil Survey Division Staff, 1993) and in the *Field Book for Describing and Sampling Soils* (Schoeneberger and others, 2002). Many of the technical terms used in the descriptions are defined in *Soil Taxonomy* (Soil Survey Staff, 1999) and in *Keys to Soil Taxonomy* (Soil Survey Staff, 2003). Unless otherwise indicated, colors in the descriptions are for dry soil. A comprehensive description of the official series is available online at <http://soils.usda.gov/technical/classification/osd/index.html>.

### Adel Series

**Taxonomic Class:** Fine-loamy, mixed, superactive Pachic Haplocryolls

#### Typical Pedon

Adel silt loam (Colors are for dry soil unless otherwise noted.)

- A1—0 to 13 inches; dark gray (10YR 4/1) loam, black (10YR 2/1) moist; moderate fine and medium granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine interstitial pores; many worm casts; slightly acid (pH 6.1); gradual wavy boundary.
- A2—13 to 31 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; weak fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine pores; many worm casts; slightly acid (pH 6.1); diffuse wavy boundary.
- A3—31 to 38 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure parting to moderate very fine and fine subangular blocky; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine and fine pores; neutral (pH 7.0); gradual wavy boundary.
- Bw—38 to 60 inches: brown (10YR 5/3) channery loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure parting to moderate very fine subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine pores; 5 percent angular cobbles, 20 percent angular gravel; neutral (pH 7.0).

### Adit Series

**Taxonomic Class:** Sandy-skeletal, mixed, frigid Aridic Lithic Ustorthents

#### Typical Pedon

Adit gravelly coarse sandy loam (Colors are for dry soil unless otherwise noted.)

- A—0 to 2 inches; brown (10YR 5/3) gravelly coarse sandy loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable, slightly sticky and nonplastic; few very fine and fine roots; 25 percent, mainly fine, gravel; neutral (pH 6.8); clear wavy boundary.
- BC—2 to 7 inches; pale brown (10YR 6/3) very gravelly coarse sand, brown (10YR 4/3) moist; single grain; loose, nonsticky and nonplastic; few very fine and fine roots; 40 percent, mainly fine, gravel; neutral (pH 6.6); abrupt wavy boundary.

Cr—7 to 14 inches; soft, weathered granite bedrock.

R—14 to 60 inches; hard granite bedrock.

## ***Amesha Series***

**Taxonomic Class:** Coarse-loamy, mixed, superactive, frigid Aridic Calcustepts

### **Typical Pedon**

Amesha loam (Colors are for dry soil unless otherwise noted.)

Ap—0 to 4 inches; light brownish gray (10YR 6/2) loam, dark grayish brown (10YR 4/2) moist; weak fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; 5 percent gravel; disseminated lime; strongly effervescent; moderately alkaline (pH 8.0); abrupt smooth boundary.

Bk1—4 to 10 inches; very pale brown (10YR 7/3) loam, brown (10YR 5/3) moist; weak medium prismatic structure; slightly hard, friable, slightly sticky and slightly plastic; common fine roots; many fine tubular pores; 5 percent gravel; common fine masses of lime; continuous distinct lime casts on undersides of gravel; violently effervescent; moderately alkaline (pH 8.2); clear wavy boundary.

Bk2—10 to 28 inches; very pale brown (10YR 8/3) loam, very pale brown (10YR 7/3) moist; weak coarse blocky structure; hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; few fine tubular pores; 5 percent gravel; many large masses of lime; continuous distinct lime coats on gravel; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary.

Bk3—28 to 49 inches; very pale brown (10YR 8/3) loam, pale brown (10YR 6/3) moist; weak coarse blocky structure separating to weak thin platy; hard, friable, slightly sticky and slightly plastic; few very fine roots and pores; 5 percent gravel; few masses of lime; continuous distinct lime coats on gravel; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary.

BC—49 to 74 inches; very pale brown (10YR 8/3) gravelly loam, pale brown (10YR 6/3) moist; massive; hard, friable, slightly sticky and slightly plastic; 15 percent gravel; common faint carbonate coats on gravel; disseminated lime; violently effervescent; moderately alkaline (pH 8.2).

## ***Anaconda Series***

**Taxonomic Class:** Coarse-loamy, mixed, superactive, frigid Aridic Haplustolls

### **Typical Pedon**

Anaconda loam (Colors are for dry soil unless otherwise noted.)

Ap—0 to 8 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; weak medium platy structure parting to moderate fine granular; loose, nonsticky and nonplastic; common fine and coarse roots; 10 percent gravel; neutral (pH 6.8); clear smooth boundary.

Bw—8 to 14 inches; yellowish brown (10YR 5/4) loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, friable, slightly sticky and slightly plastic; common fine and coarse roots; many fine irregular pores; 10 percent gravel; neutral (pH 7.0); clear wavy boundary.

Bk1—14 to 27 inches; very pale brown (10YR 8/2) gravelly loam, light yellowish brown (10YR 6/4) moist; massive; soft, friable, nonsticky and nonplastic; few fine roots; many fine irregular pores; continuous distinct fine coats and casts on gravel surfaces; common fine masses of lime; violently effervescent; 15 percent gravel; moderately alkaline (pH 8.4); clear wavy boundary.

Bk2—27 to 60 inches; very pale brown (10YR 8/3) sandy loam, light yellowish brown (10YR 6/4) moist; massive; soft, friable, nonsticky and nonplastic; few fine roots; many fine irregular pores; 10 percent gravel; continuous distinct lime casts and coats on gravel surfaces; common fine masses of lime; strongly effervescent; moderately alkaline (pH 8.4).

## ***Anamac Series***

**Taxonomic Class:** Fine-loamy, mixed, superactive, frigid Aridic Haplustolls

### **Typical Pedon**

Anamac loam (Colors are for dry soil unless otherwise noted.)

Ap—0 to 4 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak thick platy structure parting to strong fine and medium granular; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and few fine and coarse roots; many very fine and fine and few medium pores; slightly alkaline; abrupt smooth boundary.

Bw—4 to 12 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; weak medium and coarse subangular blocky structure parting to strong fine and medium granular; slightly hard, friable, slightly sticky and slightly plastic; many very fine and few fine and coarse roots; many very fine, common fine, and few medium tubular and interstitial pores; slightly alkaline; clear smooth boundary.

Bk1—12 to 18 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; weak medium and coarse prismatic structure parting to strong medium and coarse subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common very fine and few fine and coarse roots; many very fine, common fine, and few medium tubular and interstitial pores; 5 percent gravel; disseminated lime; few fine masses of lime; distinct lime coats on undersides of rock fragments; strongly effervescent; moderately alkaline; clear wavy boundary.

Bk2—18 to 31 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; weak coarse prismatic structure parting to weak fine and medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common very fine and few medium roots; many very fine and common fine tubular and interstitial pores; 5 percent gravel; disseminated lime; few fine masses of lime; distinct lime coats on undersides of rock fragments; violently effervescent; moderately alkaline; gradual wavy boundary.

BC—31 to 60 inches; very pale brown (10YR 7/4) loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, slightly sticky and slightly plastic; common very fine and few coarse roots; many very fine tubular and interstitial pores; 5 percent gravel; violently effervescent; moderately alkaline.

## ***Basincreek Series***

**Taxonomic Class:** Coarse-loamy, mixed, superactive Lamellic Haplocrypts

### **Typical Pedon**

Basincreek gravelly coarse sandy loam (Colors are for dry soil unless otherwise noted.)

Oi—0 to 2 inches; forest litter layer of slightly decomposed conifer needles and twigs.

E1—2 to 6 inches; grayish brown (10YR 5/2) gravelly coarse sandy loam, dark grayish brown (10YR 4/2) moist; weak medium granular structure; soft, very friable, slightly sticky and nonplastic; common coarse and many very fine, fine, and medium

- roots; 15 percent fine subangular gravel; moderately acid (pH 6.0); gradual smooth boundary.
- E2—6 to 20 inches; light brownish gray (10YR 6/2) gravelly coarse sandy loam; dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; common very fine, fine, and medium and few coarse roots; 15 percent fine subangular gravel; moderately acid (pH 6.0); gradual smooth boundary. (Combined thickness of the E horizons is 10 to 24 inches.)
- E and Bw1—20 to 28 inches; E part (90 percent) pale brown (10YR 6/3) gravelly coarse sandy loam, grayish brown (10YR 5/2) moist; B part (10 percent) brown (10YR 5/3) sandy loam, dark brown (10YR 3/3) moist; weak medium and coarse subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; common very fine and fine and few medium and coarse roots; 20 percent fine subangular gravel; slightly acid (pH 6.2); gradual wavy boundary.
- E and Bw2—28 to 37 inches; E part (70 percent) light yellowish brown (2.5Y 6/3) gravelly loamy coarse sand, grayish brown (2.5Y 5/2) moist; B part (30 percent) brown (10YR 5/3) sandy loam, dark brown (10YR 3/3) moist; weak coarse subangular blocky structure; E part is soft, very friable, nonsticky and nonplastic; B part is moderately hard, firm, slightly sticky and slightly plastic; few fine, medium, and coarse roots; 25 percent fine subangular gravel; neutral (pH 6.8); gradual wavy boundary. (Combined thickness of the E and Bw horizons is 12 to 30 inches.)
- BC—37 to 46 inches; light yellowish brown (2.5Y 6/3) gravelly loamy coarse sand, light olive brown (2.5Y 5/3) moist; single grain; loose, nonsticky and nonplastic; few fine roots; many interstitial pores; 25 percent fine subangular gravel; neutral (pH 6.8); abrupt wavy boundary.
- R—46 to 60 inches; hard granite bedrock.

## ***Bavdark Series***

**Taxonomic Class:** Fine-loamy, mixed, superactive Pachic Argicryolls

### **Typical Pedon**

Bavdark coarse sandy loam (Colors are for dry soil unless otherwise noted.)

- A—0 to 10 inches; dark gray (10YR 4/1) coarse sandy loam, black (10YR 2/1) moist; weak medium granular structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine and few medium roots; many very fine and common fine and medium pores; 5 percent gravel; slightly acid (pH 6.2); clear smooth boundary.
- AB—10 to 18 inches; dark gray (10YR 4/1) sandy clay loam, very dark gray (10YR 3/1) moist; moderate medium granular structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and few fine and medium roots; many very fine, common fine, and few medium pores; 5 percent gravel; slightly acid (pH 6.4); clear smooth boundary.
- Bt1—18 to 30 inches; dark grayish brown (10YR 4/2) sandy clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; hard, very friable, moderately sticky and moderately plastic; few very fine, fine, and medium roots; many very fine, common fine, and few medium pores; common faint clay films on faces of peds and lining pores; 5 percent gravel; slightly acid (pH 6.4); clear wavy boundary.
- Bt2—30 to 42 inches; brown (10YR 5/3) sandy clay loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; hard, very friable, moderately sticky and slightly plastic; few very fine, fine, and medium roots; many very fine, common fine, and few medium pores; common faint clay films on faces of peds and lining pores; 5 percent gravel; slightly acid (pH 6.2); clear wavy boundary.

C—42 to 60 inches; brown (10YR 5/3) coarse sandy loam; brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine and fine roots; many very fine, common fine, and few medium pores; 10 percent gravel; slightly acid (pH 6.2).

## ***Bearmouth Series***

**Taxonomic Class:** Sandy-skeletal, mixed Ustic Haplocryolls

### **Typical Pedon**

Bearmouth cobbly loam (Colors are for dry soil unless otherwise noted.)

A—0 to 4 inches; dark gray (10YR 4/1) cobbly loam, very dark brown (10YR 2/2) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; 20 percent cobbles; neutral (pH 6.8); clear wavy boundary.

Bw1—4 to 9 inches; brown (10YR 4/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; 15 percent cobbles, 40 percent gravel; neutral (pH 6.8); gradual wavy boundary.

Bw2—9 to 14 inches; brown (10YR 4/3) very gravelly loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; 15 percent cobbles, 40 percent gravel; neutral (pH 6.8); gradual wavy boundary.

2C—14 to 60 inches; brown (10YR 5/3) extremely cobbly sand, dark grayish brown (10YR 4/2) moist; single grain; loose; 50 percent cobbles, 20 percent gravel; few lime coats on undersides of some rock fragments at depths greater than 22 inches; slightly alkaline (pH 7.8).

## ***Beeftrail Series***

**Taxonomic Class:** Sandy, mixed Ustic Haplocryolls

### **Typical Pedon**

Beeftrail coarse sandy loam (Colors are for dry soil unless otherwise noted.)

A1—0 to 3 inches; dark grayish brown (10YR 4/2) coarse sandy loam, very dark brown (10YR 2/2) moist; moderate medium granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and common fine and medium roots; 10 percent, mainly fine, gravel; moderately acid (pH 5.8); clear smooth boundary.

A2—3 to 8 inches; very dark grayish brown (10YR 3/2) coarse sandy loam, very dark brown (10YR 2/2) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and few fine and medium roots; few very fine and fine tubular pores; 10 percent, mainly fine, gravel; slightly acid (pH 6.2); clear wavy boundary.

Bw—8 to 14 inches; brown (10YR 5/3) gravelly coarse sandy loam, brown (10YR 4/3) moist; moderate medium and coarse subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; common very fine and few fine and medium roots; few very fine tubular pores; 20 percent, mainly fine, gravel; slightly acid (pH 6.4); gradual wavy boundary.

BC—14 to 26 inches; pale brown (10YR 6/3) gravelly loamy coarse sand, brown (10YR 5/3) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; many very fine and common fine and medium interstitial pores; 30 percent, mainly fine, gravel; slightly acid (pH 6.4); clear wavy boundary.



Cr—26 to 35 inches; soft weathered granite bedrock.

R—35 to 60 inches; hard granite bedrock.

## ***Bigbutte Series***

**Taxonomic Class:** Ashy, glassy Vitrandic Haplocryolls

### **Typical Pedon**

Bigbutte gravelly ashy sandy loam (Colors are for dry soil unless otherwise noted.)

A—0 to 10 inches; dark grayish brown (10YR 4/2) gravelly ashy sandy loam, very dark brown (10YR 2/2) moist; weak fine granular structure; very friable, soft, nonsticky and nonplastic; many very fine and fine roots; many fine interstitial and irregular pores; 15 percent gravel; slightly acid (pH 6.2); clear smooth boundary.

Bw—10 to 18 inches; brown (10YR 5/3) gravelly ashy sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; very friable, soft, nonsticky and nonplastic; common fine roots; common fine irregular pores; 20 percent gravel; neutral (pH 6.6); gradual wavy boundary.

BC—18 to 27 inches; light brownish gray (10YR 6/2) gravelly ashy coarse sandy loam, grayish brown (10YR 5/2) moist; weak medium subangular blocky structure; friable, slightly hard, nonsticky and nonplastic; few fine roots; common fine irregular pores; 30 percent gravel; neutral (pH 7.0); abrupt smooth boundary.

Cr—27 to 32 inches; weakly cemented tuffaceous rhyolite.

R—32 to 60 inches; indurated tuffaceous rhyolite.

## ***Bobowic Series***

**Taxonomic Class:** Coarse-loamy, mixed, superactive Ustic Haplocryepts

### **Typical Pedon**

Bobowic gravelly coarse sandy loam (Colors are for dry soil unless otherwise noted.)

Oi—1 to 0 inches; partially decomposed needles, twigs, and leaves.

A—0 to 3 inches; dark grayish brown (10YR 4/2) gravelly coarse sandy loam, very dark brown (10YR 2/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and few fine roots; many very fine and fine and few medium pores; 20 percent gravel; neutral (pH 7.0); clear smooth boundary.

E—3 to 11 inches; light brownish gray (10YR 6/2) gravelly coarse sandy loam, dark grayish brown (10YR 4/2) moist; moderate thick platy structure parting to weak fine angular blocky; soft, very friable, slightly sticky and nonplastic; many very fine and few fine and medium roots; many very fine and few fine interstitial and tubular pores; 25 percent gravel; neutral (pH 7.0); clear wavy boundary.

Bw—11 to 21 inches; brown (10YR 5/3) gravelly coarse sandy loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; many very fine and few fine and medium roots; many very fine and few fine interstitial and tubular pores; 25 percent gravel; neutral (pH 7.0); clear wavy boundary.

Cr—21 to 34 inches; light brownish gray (10YR 6/2) decomposed granite bedrock (grus) that crushes to gravelly loamy coarse sand; neutral (pH 7.2); gradual wavy boundary.

R—34 to 60 inches; hard granite bedrock.

## ***Bonebasin Series***

**Taxonomic Class:** Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Fluvaquentic Endoaquolls

### **Typical Pedon**

Bonebasin loam (Colors are for dry soil unless otherwise noted.)

- Oe—0 to 2 inches; very dark grayish brown (10YR 3/2) mucky peat, black (10YR 2/1) moist; neutral (pH 6.8); clear smooth boundary.
- A—2 to 8 inches; dark gray (10YR 4/1) loam, very dark gray (10YR 3/1) moist; many faint yellowish red (5YR 5/6) redox concentrations; moderate medium subangular blocky structure; slightly hard, firm, moderately sticky and slightly plastic; many very fine and fine roots; common very fine and fine interstitial and tubular pores; neutral (pH 6.8); clear smooth boundary.
- Ag—8 to 15 inches; grayish brown (2.5Y 5/2) loam, very dark grayish brown (2.5Y 3/2) moist; many distinct yellowish red (5YR 5/6) redox concentrations; common faint very dark gray (5Y 3/1) redox depletions; moderate medium subangular blocky structure; slightly hard, very friable, moderately sticky and slightly plastic; many very fine roots; many very fine and fine pores; neutral (pH 6.7); clear smooth boundary. (Combined thickness of the A horizons is 10 to 18 inches.)
- Cg1—15 to 21 inches; brown (7.5YR 5/2) gravelly sandy loam, brown (7.5YR 4/2) moist; common distinct strong brown (7.5YR 5/6) redox concentrations; common faint very dark gray (5Y 3/1) redox depletions; massive; slightly hard, very friable, slightly sticky and nonplastic; many very fine roots; common very fine and fine interstitial and tubular pores; 25 percent gravel; neutral (pH 6.6).
- Cg2—21 to 25 inches; grayish brown (10YR 5/2) loam, dark brown (10YR 3/3) moist; many distinct very dark gray (5Y 3/1) redox depletions; few faint yellowish red (5YR 5/6) redox concentrations; massive; slightly hard, very friable, slightly sticky and slightly plastic; many very fine roots; many very fine and fine interstitial and tubular pores; 5 percent gravel; neutral (pH 6.7); clear smooth boundary. (Combined thickness of the Cg horizons is 8 to 20 inches.)
- 2C—25 to 60 inches; brown (7.5YR 5/2) extremely gravelly loamy sand and sand, brown (7.5YR 4/2) moist; common distinct yellowish red (5YR 5/6) redox concentrations; single grain; loose, nonsticky and nonplastic; few very fine and fine roots; 15 percent cobbles, 50 percent gravel; neutral (pH 6.8).

## ***Branham Series***

**Taxonomic Class:** Coarse-loamy, mixed, superactive Ustic Haplocryolls

### **Typical Pedon**

Branham coarse sandy loam (Colors are for dry soil unless otherwise noted.)

- A1—0 to 2 inches; grayish brown (10YR 5/2) coarse sandy loam, very dark brown (10YR 2/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine roots; 10 percent gravel; moderately acid (pH 5.8); abrupt smooth boundary.
- A2—2 to 4 inches; brown (10YR 5/3) coarse sandy loam, very dark brown (10YR 2/2) moist; moderate fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine roots; many very fine pores; 10 percent gravel; moderately acid (pH 5.8); clear smooth boundary.
- Bw—4 to 22 inches; brown (10YR 5/3) gravelly coarse sandy loam, brown (10YR 4/3) moist; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; common very fine roots; many very fine and fine pores;

few thin clay films bridging sand grains; 25 percent gravel; neutral (pH 7.1); clear smooth boundary.

BC—22 to 30 inches; very pale brown (10YR 7/3) and very pale brown (10YR 8/2) dry or moist gravelly coarse sand; single grain; loose, nonsticky and nonplastic; few very fine roots; 30 percent gravel; slightly alkaline (pH 7.6); abrupt smooth boundary.

R—30 to 60 inches; granite bedrock.

## ***Bridger Series***

**Taxonomic Class:** Fine, mixed, superactive Ustic Argicryolls

### **Typical Pedon**

Bridger loam (Colors are for dry soil unless otherwise noted.)

A—0 to 9 inches, very dark gray (10YR 3/1) loam, black (10YR 2/1) moist; moderate fine granular structure; soft, friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine pores; 1 percent stones below surface; 5 percent gravel; neutral (pH 7.0); clear smooth boundary.

Bt—9 to 24 inches; brown (10YR 5/3) clay, brown (10YR 4/3) moist; moderate medium prismatic structure parting to strong fine, medium, and coarse blocky; very hard, firm, moderately sticky and moderately plastic; common very fine roots; many very fine pores; distinct continuous very dark grayish brown (10YR 3/2) moist; clay films on faces of peds; 1 percent stones, 5 percent gravel; neutral (pH 7.0); clear wavy boundary.

Bk1—24 to 36 inches; brown (10YR 5/3) gravelly clay loam, brown (10YR 4/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine roots and pores; 5 percent cobbles, 15 percent gravel; few large masses of lime; continuous distinct lime casts on undersides of rock fragments; strongly effervescent; moderately alkaline (pH 8.0); gradual wavy boundary.

Bk2—36 to 60 inches, light yellowish brown (2.5Y 6/3) gravelly loam, light olive brown (2.5Y 5/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine roots and pores; 5 percent cobbles, 20 percent gravel; common distinct lime casts on undersides of rock fragments mainly in the upper part of the horizon; disseminated lime; strongly effervescent; moderately alkaline (pH 8.0).

## ***Bronec Series***

**Taxonomic Class:** Loamy-skeletal, mixed, superactive, frigid Aridic Calcustepts

### **Typical Pedon**

Bronec gravelly loam (Colors are for dry soil unless otherwise noted.)

A—0 to 2 inches; grayish brown (10YR 5/2) gravelly loam, dark brown (10YR 3/3) moist; weak medium granular structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine and fine pores; 15 percent gravel; slightly effervescent; slightly alkaline (pH 7.6); clear wavy boundary.

Bk1—2 to 9 inches; pale brown (10YR 6/3) gravelly loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine and fine pores; 25 percent gravel; disseminated lime; few fine masses and threads of lime; common faint lime coats on undersides of gravel; strongly effervescent; moderately alkaline (pH 8.0); clear wavy boundary.

- Bk2—9 to 21 inches; very pale brown (10YR 7/3) gravelly loam, pale brown (10YR 6/3) moist; weak coarse prismatic structure parting to moderate medium subangular blocky; hard, friable, moderately sticky and slightly plastic; few very fine and fine roots; common very fine and fine pores; 30 percent gravel; disseminated lime; common fine masses and threads of lime; common distinct lime coats on gravel; violently effervescent; strongly alkaline (pH 8.6); clear wavy boundary.
- Bk3—21 to 35 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 5/3) moist; weak coarse prismatic structure; slightly hard, very friable, slightly sticky and nonplastic; few very fine roots; common very fine pores; 45 percent gravel; disseminated lime; common fine masses and threads of lime; common distinct lime coats on undersides of gravel; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary.
- Bk4—35 to 48 inches; pale brown (10YR 6/3) very gravelly sandy loam, yellowish brown (10YR 5/4) moist; weak coarse prismatic structure; slightly hard, very friable, nonsticky and nonplastic; 45 percent gravel; disseminated lime; few faint lime coats on undersides of gravel; violently effervescent; moderately alkaline (pH 8.0); gradual wavy boundary.
- BC—48 to 60 inches; brown (10YR 5/3) very gravelly loamy sand, dark brown (10YR 3/3) moist; single grain; loose, nonsticky and nonplastic; 40 percent gravel; few faint lime coats on undersides of gravel; strongly effervescent; moderately alkaline (pH 8.0).

## ***Browns gulch Series***

**Taxonomic Class:** Coarse-loamy, mixed, superactive Pachic Haplocryolls

### **Typical Pedon**

Browns gulch sandy loam (Colors are for dry soil unless otherwise noted.)

- A1—0 to 6 inches; very dark grayish brown (10YR 3/2) sandy loam, very dark brown (10YR 2/2) moist; moderate fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many fine irregular pores; 8 percent gravel; moderately acid (pH 6.0); clear smooth boundary.
- A2—6 to 12 inches; very dark grayish brown (10YR 3/2) gravelly sandy loam, very dark brown (10YR 2/2) moist; moderate fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many fine irregular pores; 15 percent gravel; slightly acid (pH 6.4); clear smooth boundary.
- A3—12 to 20 inches; dark grayish brown (10YR 4/2) gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine irregular pores; 20 percent gravel; neutral (pH 6.8); abrupt wavy boundary.
- Bw—20 to 33 inches; brown (10YR 5/3) gravelly sandy loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; common fine and many very fine roots; common fine irregular pores; 25 percent gravel; neutral (pH 6.8); abrupt wavy boundary.
- C—33 to 60 inches; brown (10YR 5/3) gravelly sandy loam, brown (10YR 4/3) moist; massive; firm, hard, nonsticky and nonplastic; few fine roots; common fine irregular pores; 30 percent gravel; neutral (pH 6.8).

## ***Bullrey Series***

**Taxonomic Class:** Loamy-skeletal, mixed, superactive Pachic Haplocryolls

### Typical Pedon

Bullrey very gravelly loam (Colors are for dry soil unless otherwise noted.)

- A1—0 to 4 inches; dark grayish brown (10YR 4/2) very gravelly loam, very dark brown (10YR 2/2) moist; weak very thin platy and weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many fine roots; many very fine interstitial pores; 40 to 50 percent of surface is covered by channery fragments and angular gravel; strongly acid (pH 5.5); clear wavy boundary.
- A2—4 to 9 inches; dark grayish brown (10YR 4/2) very gravelly loam, very dark brown (10YR 2/2) moist; weak fine and medium subangular blocky structure parting to moderate very fine and fine granular; soft, very friable, slightly sticky and slightly plastic; common very fine and fine and few medium roots; many very fine tubular pores; 45 percent coarse gravel; moderately acid (pH 5.7); clear wavy boundary.
- Bw1—9 to 14 inches; dark grayish brown (10YR 4/2) very gravelly loam, very dark brown (10YR 2/2) moist (rubbed); weak fine and medium subangular blocky structure parting to moderate very fine and fine granular; slightly hard, friable, slightly sticky and slightly plastic; common fine and few medium roots; many very fine tubular pores; common thin clay films in pores and root channels; 50 percent coarse gravel; moderately acid (pH 5.7); clear wavy boundary.
- Bw2—14 to 22 inches; grayish brown (10YR 5/2) very gravelly loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure parting to weak very fine and fine granular; slightly hard, friable, slightly sticky and slightly plastic; common fine roots; few fine pores; 55 percent coarse gravel; moderately acid (pH 5.7); clear wavy boundary.
- C1—22 to 26 inches; light gray (10YR 7/2) very gravelly loam, brown (10YR 5/3) moist; very weak medium and thick platy and weak very fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and few medium roots; many very fine tubular pores; common speckling of uncoated sand grains; 35 percent coarse gravel; moderately acid (pH 5.7); clear irregular boundary.
- C2—26 to 48 inches; light gray (10YR 7/2) gravelly sandy loam, brown (10YR 5/3) moist; common fine distinct light yellowish brown (10YR 6/4) streaks and mottles, yellowish brown (10YR 5/4) moist; weak thick platy structure; hard, firm (brittle), nonsticky and nonplastic; few fine, medium, and coarse roots; many very fine tubular pores; 3 percent flagstones, 20 percent gravel; strongly acid (pH 5.5); clear irregular boundary.
- C3—48 to 60 inches; light gray (10YR 7/2) extremely gravelly sandy loam, brown (10YR 5/3) moist; massive; hard, firm, nonsticky and nonplastic; few fine roots; few very fine pores; 10 percent flagstones, 60 to 70 percent gravel; strongly acid (pH 5.5).

### Caseypeak Series

**Taxonomic Class:** Loamy-skeletal, mixed, superactive Lithic Eutrocrypts

### Typical Pedon

Caseypeak gravelly coarse sandy loam, bouldery (Colors are for dry soil unless otherwise noted.)

- Oi—1.5 to 0 inches; partially decomposed needles, twigs, and leaves.
- E—0 to 5 inches; light brownish gray (10YR 6/2) gravelly coarse sandy loam, brown (10YR 5/3) moist; moderate medium granular structure; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine and common medium roots; many very fine and fine and few medium pores; 20 percent gravel; slightly acid (pH 6.2); clear wavy boundary.

Bw1—5 to 11 inches; brown (10YR 5/3) very gravelly coarse sandy loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine and common medium roots; many very fine and few fine tubular and interstitial pores; 40 percent gravel; neutral (pH 6.6); gradual wavy boundary.

Bw2—11 to 16 inches; pale brown (10YR 6/3) very gravelly coarse sandy loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine, common fine, and few medium roots; many very fine and few fine tubular and interstitial pores; 40 percent gravel; neutral (pH 6.7); clear wavy boundary.

Cr—16 to 19 inches; light yellowish brown (2.5Y 6/4) decomposed granite bedrock (grus) that crushes to very gravelly loamy coarse sand; neutral (pH 6.8).

R—19 to 60 inches; hard granite bedrock.

### ***Cetrack Series***

**Taxonomic Class:** Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Aridic Haplustolls

#### **Typical Pedon**

Cetrack loam (Colors are for dry soil unless otherwise noted.)

Ap—0 to 6 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; slightly hard, very friable, slightly sticky and slightly plastic; neutral (pH 7.1); abrupt smooth boundary.

Bw—6 to 12 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; 5 percent gravel; few worm casts; slightly alkaline (pH 7.5); gradual smooth boundary.

Bk1—12 to 16 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; weak fine and medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; 5 percent gravel; few medium threads and nodules of lime; strongly effervescent; moderately alkaline (pH 7.9); gradual smooth boundary.

Bk2—16 to 32 inches; light gray (10YR 7/2) loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; 10 percent gravel; many fine lime nodules; violently effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

2C—32 to 60 inches; light gray (10YR 7/2) very gravelly loamy sand, grayish brown (10YR 5/2) moist; single grain; loose, nonsticky and nonplastic; 20 percent cobbles, 40 percent gravel; common distinct lime coats on rock fragments; strongly effervescent in upper part; slightly alkaline (pH 7.6).

### ***Chinasprings Series***

**Taxonomic Class:** Ashy, glassy, frigid Vitrandic Argiustolls

#### **Typical Pedon**

Chinasprings gravelly sandy loam (Colors are for dry soil unless otherwise noted.)

A—0 to 6 inches; very dark gray (10YR 3/1) gravelly ashy sandy loam, black (10YR 2/1) moist; moderate fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; few very fine tubular pores; 2 percent cobbles, 15 percent gravel; slightly acid (pH 6.2); clear smooth boundary.

- Bt—6 to 20 inches; brown (10YR 5/3) gravelly ashy sandy clay loam, brown (10YR 4/3) moist; strong medium subangular blocky structure; hard, very friable, moderately sticky and moderately plastic; many very fine and fine roots; few medium tubular pores; common distinct clay films on faces of peds; 2 percent cobbles, 15 percent gravel; neutral (pH 7.0); gradual smooth boundary.
- Bk—20 to 44 inches; pale brown (10YR 6/3) gravelly ashy sandy loam, brown (10YR 4/3) moist; moderate fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine and many very fine roots; few medium tubular pores; 2 percent cobbles, 25 percent gravel; common fine masses of lime; violently effervescent; moderately alkaline (pH 8.2); clear wavy boundary.
- Bck—44 to 58 inches; pale brown (10YR 6/3) gravelly ashy sandy loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine and many very fine roots; few medium tubular pores; 1 percent cobbles, 20 percent gravel; common fine masses of lime; violently effervescent; moderately alkaline (pH 8.0); clear wavy boundary.
- Cr—58 to 60 inches; very pale brown (10YR 7/3) semiconsolidated tuff that crushes to silt loam.

## ***Comad Series***

**Taxonomic Class:** Sandy-skeletal, mixed Lamellic Cryorthents

### **Typical Pedon**

Comad extremely stony sandy loam (Colors are for dry soil unless otherwise noted.)

- Oi—0 to 3 inches; undecomposed and slightly decomposed forest litter.
- E1—3 to 8 inches; light brownish gray (10YR 6/2) extremely stony sandy loam, brown (10YR 5/3) moist; moderate very fine and fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine and few medium and coarse roots; 30 percent stones, 25 percent cobbles, 15 percent gravel; strongly acid (pH 5.4); clear smooth boundary.
- E2—8 to 20 inches; very pale brown (10YR 7/3) extremely stony loamy sand, brown (10YR 5/3) moist; weak fine and medium granular structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine and few medium roots; many very fine tubular and interstitial pores; 30 percent stones, 25 percent cobbles, 15 percent gravel; strongly acid (pH 5.3); gradual wavy boundary.
- E and Bt1—20 to 33 inches; E part (90 percent) very pale brown (10YR 7/3) extremely stony loamy sand, yellowish brown (10YR 5/4) moist; weak fine granular structure; slightly hard, very friable, nonsticky and nonplastic; Bt part (10 percent) yellowish brown (10YR 5/4) sandy clay loam lamellae; hard, friable, slightly sticky and slightly plastic; lamellae are wavy and discontinuous, 1/8- to 1/2-inch thick and 2- to 6-inches apart; common very fine and fine and few medium roots; many very fine tubular and interstitial pores; 30 percent stones, 25 percent cobbles, 20 percent gravel; moderately acid (pH 5.7); gradual smooth boundary.
- E and Bt2—33 to 60 inches; E part (95 percent) very pale brown (10YR 7/4) extremely stony loamy sand, yellowish brown (10YR 5/6) moist; massive; slightly hard, very friable, slightly sticky and nonplastic; few fine and medium roots; few very fine tubular pores; Bt2 part (5 percent) dark yellowish brown (10YR 4/4) moist sandy loam lamellae; 35 percent stones, 30 percent cobbles, 15 percent gravel; moderately acid (pH 5.7).

## ***Cometcrik Series***

**Taxonomic Class:** Fine-loamy, mixed, superactive, frigid Cumulic Endoaquolls

### **Typical Pedon**

Cometcrik loam (Colors are for moist soil unless otherwise noted.)

- A—0 to 12 inches; black (10YR 2/1) loam, very dark gray (10YR 3/1) dry; moderate fine granular structure; hard, very friable, moderately sticky and slightly plastic; many very fine and fine and common medium roots; many very fine and fine pores; neutral (pH 6.8); gradual smooth boundary.
- Bw—12 to 24 inches; black (10YR 2/1) loam, very dark grayish brown (10YR 3/2) dry; few fine distinct yellowish red (5YR 4/6) dry, redox concentrations; weak medium subangular blocky structure; very hard, very friable, moderately sticky and slightly plastic; many very fine and common fine and medium roots; many very fine and common fine pores; neutral (pH 6.8); clear smooth boundary.
- Cg—24 to 42 inches; very dark gray (10YR 3/1) silty clay loam, grayish brown (2.5Y 5/2) dry; common fine distinct yellowish red (5YR 4/6) dry, redox concentrations; massive; extremely hard, firm, very sticky and moderately plastic; few very fine and fine roots; few very fine and fine pores; 5 percent gravel; neutral (pH 7.0); gradual wavy boundary.
- 2Cg—42 to 58 inches; brown (10YR 5/3) gravelly loamy coarse sand, pale brown (10YR 6/3) dry; massive; hard, very friable, nonsticky and nonplastic; 30 percent gravel; neutral (pH 7.0); clear wavy boundary.
- 3Cg—58 to 60 inches; dark gray (10YR 4/1) loam consisting of fine strata of very fine sandy loam and silty clay loam, grayish brown (10YR 5/2) dry; common medium distinct strong brown (7.5YR 5/6) dry, redox concentrations; massive; very hard, friable, moderately sticky and slightly plastic; 5 percent gravel; neutral (pH 7.0).

## ***Con Series***

**Taxonomic Class:** Fine-loamy, mixed, superactive, frigid Aridic Haplustolls

### **Typical Pedon**

Con loam (Colors are for dry soil unless otherwise noted.)

- Ap—0 to 7 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; weak medium granular structure; soft, friable, nonsticky and nonplastic; common very fine and fine roots; 5 percent gravel; neutral (pH 6.6); clear smooth boundary.
- Bw—7 to 11 inches; yellowish brown (10YR 5/4) clay loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable, moderately sticky and slightly plastic; common very fine and fine roots; many fine irregular pores; 5 percent gravel; slightly alkaline (pH 7.4); clear smooth boundary.
- Bk1—11 to 21 inches; very pale brown (10YR 8/2) loam, very pale brown (10YR 7/4) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; many fine irregular pores; continuous distinct lime casts and coats on gravel surfaces; common fine masses of lime; violently effervescent; 5 percent gravel; moderately alkaline (pH 8.2); clear wavy boundary.
- Bk2—21 to 34 inches; very pale brown (10YR 7/3) loam, brown (10YR 5/3) moist; weak fine subangular blocky structure; soft, friable, slightly sticky and nonplastic; few very fine and fine roots; common fine irregular pores; 5 percent gravel; continuous distinct lime casts and coats on gravel surfaces; common fine masses of lime; violently effervescent; moderately alkaline (pH 8.2); gradual wavy boundary.



Bk3—34 to 60 inches; very pale brown (10YR 7/3) gravelly loam, pale brown (10YR 6/3) moist; weak fine subangular blocky structure; soft, friable, nonsticky and nonplastic; few very fine and fine roots; common fine irregular pores; 15 percent gravel; continuous distinct lime casts and coats on surface of gravel; common fine masses of lime; violently effervescent; moderately alkaline (pH 8.4).

## ***Copenhaver Series***

**Taxonomic Class:** Loamy-skeletal, mixed, superactive Lithic Argicryolls

### **Typical Pedon**

Copenhaver gravelly loam (Colors are for dry soil unless otherwise noted.)

A—0 to 5 inches; dark grayish brown (10YR 4/2) gravelly loam, very dark brown (10YR 2/2) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; many very fine pores; 25 percent gravel; neutral (pH 7.2); clear smooth boundary.

Bt—5 to 14 inches; reddish brown (5YR 4/3) very gravelly clay loam, dark reddish brown (5YR 3/3) moist; weak fine subangular blocky structure; very hard, friable, slightly sticky and moderately plastic; many very fine and fine roots; many very fine and fine pores; few faint clay films on faces of peds and on rock fragments; 10 percent cobbles, 40 percent gravel; slightly alkaline (pH 7.6); abrupt smooth boundary.

R—14 to 60 inches; andesite bedrock.

## ***Coslaw Series***

**Taxonomic Class:** Ashy-skeletal, glassy, shallow Ustivitrandid Haplocrypts

### **Typical Pedon**

Coslaw gravelly ashy sandy loam (Colors are for dry soil unless otherwise noted.)

A—0 to 4 inches; grayish brown (2.5Y 5/2) gravelly ashy sandy loam, very dark grayish brown (2.5Y 3/2) moist; weak fine granular structure; slightly hard, very friable, nonsticky and nonplastic; few very fine and fine roots; 25 percent gravel; strongly acid (pH 5.4); clear wavy boundary.

Bw—4 to 18 inches; light brownish gray (2.5Y 6/2) very gravelly ashy sandy loam, very dark grayish brown (2.5Y 3/2) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; few very fine and fine roots; common very fine pores; 10 percent cobbles, 40 percent gravel; neutral (pH 6.6); gradual wavy boundary.

Cr—18 to 31 inches; light gray (5Y 7/2) decomposing welded tuff bedrock that crushes to very gravelly ashy sandy loam; neutral (pH 6.8).

R—31 to 60 inches; white fractured hard welded tuff bedrock.

## ***Danaher Series***

**Taxonomic Class:** Fine, mixed, superactive USTIC Glossocryalfs

### **Typical Pedon**

Danaher loam (Colors are for dry soil unless otherwise noted.)

Oi—0 to 0.5 inch; forest litter, mostly undecomposed.

Oe—0.5 to 2 inches; forest litter, mostly decomposed.

- E—2 to 5 inches; light brownish gray (10YR 6/2) loam, dark grayish brown (10YR 4/2) moist; moderate medium granular structure; slightly hard, friable, slightly sticky and slightly plastic; many fine and medium roots; many very fine and fine continuous irregular pores; slightly acid (pH 6.2); clear wavy boundary.
- E/Bt—5 to 9 inches; E part (70 percent) light brownish gray (10YR 6/2) silt loam, dark grayish brown (10YR 4/2) moist tongues; Bt part (30 percent) grayish brown (10YR 5/2) clay loam, brown (7.5YR 4/2) moist; weak medium subangular blocky structure; slightly hard, friable, moderately sticky and moderately plastic; common fine and medium roots; common very fine and fine irregular pores; 5 percent gravel; slightly acid (pH 6.2); gradual wavy boundary.
- Bt1—9 to 22 inches; brown (7.5YR 5/4) clay loam, reddish brown (5YR 4/3) moist; moderate medium subangular blocky structure; hard, firm, moderately sticky and moderately plastic; common very fine roots; common very fine and fine irregular pores; many faint clay films on faces of peds; 10 percent gravel; moderately acid (pH 5.8); gradual wavy boundary.
- Bt2—22 to 40 inches; reddish brown (5YR 5/3) clay loam, strong brown (7.5YR 5/6) moist; moderate medium subangular blocky structure; hard, firm, moderately sticky and moderately plastic; common very fine roots; few fine discontinuous tubular pores; continuous faint clay films on faces of peds; 10 percent gravel; slightly acid (pH 6.3); gradual wavy boundary.
- Bt3—40 to 60 inches; reddish brown (5YR 5/3) clay, reddish brown (5YR 4/3) moist; moderate medium subangular blocky structure; very hard, very fine, moderately sticky and moderately plastic; few very fine roots; few fine discontinuous tubular pores; few faint clay films on faces of peds; 10 percent gravel; neutral (pH 7.0).

## ***Danielvil Series***

**Taxonomic Class:** Coarse-loamy, mixed, superactive Ustic Haplocryolls

### **Typical Pedon**

Danielvil loam (Colors are for dry soil unless otherwise noted.)

- A1—0 to 7 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; moderate medium granular structure; soft, friable, slightly sticky and slightly plastic; many very fine and fine and common medium roots; common very fine interstitial pores; neutral (pH 7.0); clear smooth boundary.
- A2—7 to 12 inches; dark grayish brown (10YR 4/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure parting to moderate fine granular; soft, very friable, slightly sticky and slightly plastic; many very fine and fine and common medium roots; common very fine interstitial pores; 5 percent cobbles, 10 percent gravel; neutral (pH 7.0); clear smooth boundary.
- Bw—12 to 21 inches; brown (10YR 5/3) fine sandy loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine and few medium roots; common very fine interstitial pores; 5 percent cobbles, 10 percent gravel; neutral (pH 7.0); clear smooth boundary.
- C1—21 to 34 inches; brown (10YR 5/3) gravelly fine sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and nonplastic; common very fine and few fine roots; common very fine interstitial pores; 5 percent cobbles, 10 percent gravel; neutral (pH 7.0); gradual smooth boundary.
- C2—34 to 60 inches; brown (10YR 4/3) gravelly sandy loam, dark brown (10YR 3/3) moist; massive; soft, very friable, slightly sticky and nonplastic; few very fine and fine roots; common very fine interstitial pores; 5 percent cobbles, 10 percent gravel; neutral (pH 7.0).

## ***Dinnen Series***

**Taxonomic Class:** Coarse-loamy, mixed, superactive Ustic Haplocryolls

### **Typical Pedon**

Dinnen sandy loam (Colors are for dry soil unless otherwise noted.)

- A—0 to 8 inches; brown (10YR 5/3) coarse sandy loam, dark brown (10YR 3/3) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; few fine and medium roots; slightly acid; clear wavy boundary.
- AC—8 to 16 inches; yellowish brown (10YR 5/4) gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure parting to moderate fine granular; extremely hard, very friable, nonsticky and nonplastic; 15 to 20 percent very fine and fine angular granitic gravel; soil peds show small volume change on wetting and drying; few fine and medium roots; moderately acid; clear wavy boundary.
- C—16 to 60 inches; yellowish brown (10YR 5/4) gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; massive separating to single grain; extremely hard, very friable, nonsticky and nonplastic; 20 percent very fine and fine angular granitic gravel; little volume change on wetting and drying; few fine roots to 30 inches; moderately acid.

## ***Dutton Series***

**Taxonomic Class:** Fine, smectitic, frigid Torrertic Argiustolls

### **Typical Pedon**

Dutton silty clay loam (Colors are for dry soil unless otherwise noted.)

- Ap—0 to 6 inches; grayish brown (10YR 5/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; moderate very fine and fine granular structure; hard, friable, moderately sticky and moderately plastic; many unstained sand and silt grains; neutral (pH 7.2); abrupt smooth boundary.
- Bt1—6 to 14 inches; brown (10YR 5/3) silty clay, brown (10YR 4/3) moist; strong fine and medium prismatic structure parting to strong very fine and fine subangular blocky; extremely hard, firm, moderately sticky and very plastic; many very fine roots; many very fine and fine and few medium tubular pores; continuous prominent clay films on faces of peds; common pressure faces; slightly alkaline (pH 7.6); clear wavy boundary.
- Bt2—14 to 17 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; strong medium prismatic structure parting to strong very fine and fine angular and subangular blocky; extremely hard, friable, moderately sticky and moderately plastic; many very fine roots; many very fine and fine and few medium tubular pores; continuous distinct clay films on faces of peds; common pressure faces; 5 percent gravel; few faint lime coats on gravel; slightly effervescent; moderately alkaline (pH 8.4); clear wavy boundary.
- Bk1—17 to 27 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; strong medium prismatic structure parting to moderate fine and medium blocky; extremely hard, friable, moderately sticky and moderately plastic; many very fine roots; many very fine and fine and few medium tubular pores; few very dark grayish brown (2.5Y 3/2) coats on faces of prisms; common fine and medium masses and threads of segregated lime; 5 percent gravel; few faint lime coats on gravel; strongly effervescent; strongly alkaline (pH 8.6); clear wavy boundary.
- 2Bk2—27 to 30 inches; grayish brown (2.5Y 5/2) extremely channery loam, dark grayish brown (2.5Y 4/2) moist; massive; slightly hard, very friable, nonsticky and

nonplastic; many very fine roots; many very fine and fine and few medium tubular pores; 65 percent channers; common distinct lime coats on channers; strongly effervescent; strongly alkaline (pH 9.0); clear wavy boundary.

3Bk3—30 to 36 inches; grayish brown (2.5Y 5/2) clay, dark grayish brown (2.5Y 4/2) moist; massive; extremely hard, firm, moderately sticky and moderately plastic; few very fine roots; common very fine and fine tubular pores; 10 percent shale fragments; many very fine masses of segregated lime; strongly effervescent; very strongly alkaline (pH 9.2); gradual wavy boundary.

Cr—36 to 64 inches; grayish brown (2.5Y 5/2) fine and medium platy shale interbedded with 1- to 3-inch thick layers of hard sandstone, dark grayish brown (2.5Y 4/2) moist; common fine masses and threads of lime between plates and in fine cracks; slightly effervescent; strongly alkaline (pH 8.9).

## ***Eastridge Series***

**Taxonomic Class:** Ashy-skeletal, glassy Vitrandic Haplocryalfs

### **Typical Pedon**

Eastridge very cobbly ashy loam (Colors are for dry soil unless otherwise noted.)

Oi—0 to 2 inches; slightly decomposed forest litter.

E1—2 to 6 inches; dark gray (10YR 4/1) very cobbly ashy loam, very dark gray (10YR 3/1) moist; weak medium subangular blocky structure; very friable, slightly hard, slightly sticky and slightly plastic; many very fine roots; common very fine irregular pores; 20 percent cobbles, 20 percent gravel; slightly acid (pH 6.2); clear wavy boundary.

E2—6 to 11 inches; brown (10YR 5/3) very cobbly ashy sandy loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; friable, hard, slightly sticky and slightly plastic; common fine and many very fine roots; many very fine and common fine and medium irregular pores; 25 percent cobbles, 20 percent gravel; moderately acid (pH 6.0); clear wavy boundary.

E/Bt—11 to 15 inches; E part (60 percent) is brown (10YR 5/3) very cobbly ashy sandy clay loam, brown (10YR 4/3) moist; weak medium prismatic structure; hard, friable, slightly sticky and slightly plastic; common fine roots; common fine tubular pores; Bt part (40 percent) is dark grayish brown (10YR 4/2) very cobbly ashy sandy clay loam, very dark grayish brown (10YR 3/2) moist; weak coarse subangular blocky structure; hard, firm, moderately sticky and moderately plastic; common fine roots; common very fine and fine tubular pores; common discontinuous faint clay films on faces of peds; 25 percent cobbles, 20 percent gravel; moderately acid (pH 6.0); clear wavy boundary.

Bt—15 to 28 inches; yellowish brown (10YR 5/4) very cobbly ashy sandy clay loam, dark yellowish brown (10YR 4/4) moist; moderate coarse subangular blocky structure; friable, hard, moderately sticky and moderately plastic; common fine roots; common very fine and fine tubular pores; common discontinuous distinct clay films on faces of peds; 25 percent cobbles, 20 percent gravel; moderately acid (pH 6.0); clear wavy boundary.

BC—28 to 60 inches; light yellowish brown (2.5Y 6/3) very cobbly ashy sandy loam, light olive brown (2.5Y 5/3) moist; weak medium subangular blocky structure; friable, slightly hard, slightly sticky and slightly plastic; few fine roots; few fine irregular pores; 30 percent cobbles, 20 percent gravel; slightly acid (pH 6.2)

## ***Elve Series***

**Taxonomic Class:** Loamy-skeletal, mixed, superactive Ustic Eutrocrypts

### Typical Pedon

Elve very cobbly loam (Colors are for dry soil unless otherwise noted.)

- Oe—0 to 1 inch; forest litter of undecomposed and decomposed needles, twigs, and cones.
- A—1 to 3 inches; pale brown (10YR 6/3) very cobbly loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; soft, very friable, slightly sticky and slightly plastic; many medium and coarse roots; many very fine and fine pores; 25 percent angular cobbles, 30 percent angular gravel; moderately acid (pH 5.8); abrupt wavy boundary.
- E—3 to 18 inches; very pale brown (10YR 7/4) very cobbly loam, yellowish brown (10YR 5/4) moist; moderate fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine, medium, and coarse roots; many very fine and fine pores; 30 percent angular cobbles, 25 percent angular gravel; strongly acid (pH 5.5); gradual wavy boundary.
- Bw1—18 to 34 inches; light yellowish brown (10YR 6/4) extremely cobbly loam, yellowish brown (10YR 5/6) moist; moderate fine subangular blocky structure parting to moderate fine granular; slightly hard, friable, slightly sticky and slightly plastic; common fine, medium, and coarse roots; many very fine and fine pores; 35 percent angular cobbles, 30 percent angular gravel; strongly acid (pH 5.4); gradual wavy boundary.
- Bw2—34 to 47 inches; yellow (10YR 7/6) extremely cobbly sandy loam, yellowish brown (10YR 5/6) moist; weak fine subangular blocky structure parting to weak fine granular; hard, friable, slightly sticky and slightly plastic; common fine, medium, and coarse roots; many very fine and fine pores; 35 percent angular cobbles, 30 percent angular gravel; strongly acid (pH 5.4); gradual wavy boundary.
- BC—47 to 60 inches; yellow (10YR 7/6) extremely cobbly sandy loam, yellowish brown (10YR 5/6) moist; massive; slightly hard, very friable, slightly sticky and nonplastic; few very fine and fine roots; common fine irregular pores; 45 percent angular cobbles, 40 percent angular gravel; strongly acid (pH 5.2).

### ***Euell Series***

**Taxonomic Class:** Ashy-Skeletal, glassy Vitrandic Argicryolls

### Typical Pedon

Euell gravelly ashy loam (Colors are for dry soil unless otherwise noted.)

- A—0 to 10 inches; dark grayish brown (10YR 4/2) gravelly ashy loam, very dark brown (10YR 2/2) moist; weak fine granular structure; very friable, soft, slightly sticky and slightly plastic; many very fine and fine and common medium roots; many fine irregular pores; 5 percent stones, 5 percent cobbles, 20 percent gravel; moderately acid (pH 5.8); clear smooth boundary.
- Bt—10 to 31 inches; brown (10YR 5/3) extremely gravelly ashy sandy clay loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; friable, slightly hard, slightly sticky and moderately plastic; common very fine and fine and few medium roots; common very fine tubular pores; common faint discontinuous clay films on faces of peds and lining pores; 5 percent stones, 5 percent cobbles, 55 percent gravel; neutral (pH 6.8); gradual smooth boundary.
- BC—31 to 43 inches; light olive brown (2.5Y 5/3) very gravelly ashy sandy loam, olive brown (2.5Y 4/3) moist; weak medium subangular blocky structure; friable, slightly hard, slightly sticky and slightly plastic; few very fine and fine roots; common very fine and few fine tubular pores; 5 percent stones, 5 percent cobbles, 45 percent gravel; neutral (pH 7.0); abrupt smooth boundary.
- R—43 to 60 inches; indurated tuffaceous rhyolite.

## ***Evapo Series***

**Taxonomic Class:** Loamy-skeletal, mixed, superactive Lamellic Eutrocryepts

### **Typical Pedon**

Evapo gravelly loam (Colors are for dry soil unless otherwise noted.)

O<sub>i</sub>—0 to 2 inches; slightly decomposed forest litter.

A—2 to 8 inches; light yellowish brown (10YR 6/4) gravelly ashy loam, dark yellowish brown (10YR 4/4) moist; weak medium granular structure; soft, very friable, nonsticky and slightly plastic; many fine and medium roots; many fine pores; 25 percent gravel; ash influenced with about 50 percent glass and a moist bulk density of less than 0.95 g/cm<sup>3</sup>; slightly acid (pH 6.4); clear smooth boundary.

2E<sub>1</sub>—8 to 17 inches; light brownish gray (10YR 6/2) very gravelly loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many fine and medium roots; common fine pores; 10 percent cobbles, 40 percent gravel; slightly acid (pH 6.2); clear wavy boundary.

2E<sub>2</sub>—17 to 25 inches; light gray (10YR 7/2) very gravelly sandy loam, grayish brown (10YR 5/2) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common fine and medium roots; common fine pores; 10 percent cobbles, 45 percent gravel; slightly acid (pH 6.4); gradual wavy boundary.

2E and B<sub>t</sub>—25 to 60 inches; E part (75 percent) is very pale brown (10YR 7/3) extremely gravelly sandy loam, brown (10YR 5/3) moist; B part (25 percent) is few discontinuous pale brown (10YR 6/3) extremely gravelly fine sandy loam lamellae 1/16- to 1/4-inch thick, brown (10YR 5/3) moist; texture, mixed, is extremely gravelly sandy loam; massive; slightly hard, very friable, nonsticky and nonplastic; few fine roots; common fine pores; 15 percent cobbles, 60 percent gravel; neutral (pH 6.6).

## ***Fleecer Series***

**Taxonomic Class:** Coarse-loamy, mixed, superactive Pachic Haplocryolls

### **Typical Pedon**

Fleecer coarse sandy loam (Colors are for dry soil unless otherwise noted.)

A<sub>1</sub>—0 to 4 inches; very dark grayish brown (10YR 3/2) coarse sandy loam, very dark brown (10YR 2/2) moist; moderate medium granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and common fine and medium roots; 10 percent, mainly fine, gravel; moderately acid (pH 6.0); clear smooth boundary.

A<sub>2</sub>—4 to 18 inches; very dark brown (10YR 2/2) gravelly coarse sandy loam, black (10YR 2/1) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine and few medium roots; few very fine and fine tubular pores; 15 percent, mainly fine, gravel; slightly acid (pH 6.4); clear wavy boundary.

B<sub>w</sub>—18 to 32 inches; brown (10YR 4/3) gravelly coarse sandy loam, dark brown (10YR 3/3) moist; weak medium prismatic structure parting to moderate medium subangular blocky; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and few fine roots; few very fine tubular pores; 20 percent, mainly fine, gravel; neutral (pH 6.6); gradual wavy boundary.

BC—32 to 50 inches; grayish brown (10YR 5/2) gravelly loamy coarse sand, dark grayish brown (10YR 4/2) moist; weak coarse subangular blocky structure; soft, very friable, nonsticky and nonplastic; few very fine roots in upper portion; common

- very fine and fine interstitial pores; 2 percent cobbles, 30 percent, mainly fine, gravel; neutral (pH 6.8); diffuse wavy boundary.
- C—50 to 60 inches; light yellowish brown (2.5Y 6/4) gravelly loamy coarse sand, light olive brown (2.5Y 5/4) moist; single grain; loose, nonsticky and nonplastic; many very fine and fine interstitial pores; 5 percent cobbles, 25 percent, mainly fine, gravel; slightly alkaline (pH 7.4).

## ***Foolhen Series***

**Taxonomic Class:** Fine-loamy, mixed, superactive Typic Cryaquolls

### **Typical Pedon**

Foolhen loam (Colors are for moist soil unless otherwise noted.)

- Oi—0 to 6 inches; partially decomposed organic matter.
- Oe—6 to 11 inches; gray (10YR 4/1) mucky peat, dark gray (10YR 5/1) dry.
- A—11 to 19 inches; very dark gray (10YR 3/1) loam, gray (10YR 5/1) dry; weak fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; common very fine tubular pores; neutral; clear smooth boundary.
- Bg—19 to 24 inches; very dark gray (10YR 3/1) sandy loam, gray (10YR 5/1) dry; many medium distinct light olive brown (2.5Y 5/6) and olive yellow (2.5Y 6/6) dry redox concentrations; weak fine subangular blocky structure; soft, friable, nonsticky and nonplastic; many very fine and fine roots; common very fine tubular pores; slightly alkaline; clear smooth boundary.
- Cg1—24 to 34 inches; gray (5Y 5/1) loam with lenses of very fine sandy loam 1- to 2-inches thick, gray (5Y 6/1) dry; many medium distinct light olive brown (2.5Y 5/6) and olive yellow (2.5Y 6/6) dry redox concentrations; massive; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine tubular pores; moderately alkaline; gradual wavy boundary.
- Cg2—34 to 46 inches; gray (5Y 5/1) gravelly sandy clay loam, gray (5Y 6/1) dry; many medium distinct yellowish brown (10YR 5/8) and brownish yellow (10YR 6/8) dry redox concentrations; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; common very fine tubular pores; 20 percent gravel; moderately alkaline; gradual wavy boundary.
- Cg3—46 to 60 inches; olive (5Y 5/3) very gravelly silt loam, light gray (5Y 7/2) dry; many medium distinct yellowish brown (10YR 5/8) and brownish yellow (10YR 6/8) dry redox concentrations; massive; slightly hard, friable, slightly sticky and moderately plastic; few very fine and fine roots; few fine irregular tubular pores; 40 percent gravel; slightly alkaline.

## ***Foxgulch Taxadjunct***

**Taxonomic Class:** Fine-loamy, mixed, superactive Fluvaquent Haplocryolls

### **Typical Pedon**

Foxgulch loam (Colors are for dry soil unless otherwise noted.)

- A1—0 to 4 inches; dark grayish brown (10YR 4/2), loam, very dark brown (10YR 2/2) moist; moderate fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine interstitial pores; 3 percent gravel; neutral (pH 7.0); gradual smooth boundary.
- A2—4 to 9 inches; grayish brown (10YR 5/2), loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; slightly hard, friable, slightly sticky

and slightly plastic; many very fine and fine roots; many very fine interstitial pores; 3 percent gravel; neutral (pH 7.0); gradual smooth boundary.

BC—9 to 27 inches; brown (10YR 5/3), loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine tubular pores; neutral (pH 7.0); gradual wavy boundary.

C—27 to 60 inches; very pale brown (10YR 7/4), loam, yellowish brown (10YR 5/4) moist; massive; hard, firm, slightly sticky and slightly plastic; few very fine and fine roots; common very fine and few fine tubular pores; masses of oxidized iron; neutral (pH 7.0).

## ***Frenchcreek Series***

**Taxonomic Class:** Loamy-skeletal, mixed, superactive, frigid Aridic Haplustolls

### **Typical Pedon**

Frenchcreek very gravelly loam (Colors are for dry soil unless otherwise noted.)

A—0 to 5 inches; grayish brown (10YR 5/2) very gravelly loam, very dark grayish brown (10YR 3/3) moist; moderate very thin platy structure parting to moderate very fine granular; slightly hard, very friable, slightly sticky and slightly plastic; many very fine roots; 55 percent angular gravel; slightly acid (pH 6.1); clear smooth boundary.

Bw1—5 to 12 inches; brown (10YR 5/3) extremely gravelly loam, dark brown (10YR 4/3) moist; weak fine and medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common very fine roots; many very fine tubular and interstitial pores; 60 percent angular gravel; slightly acid (pH 6.2); gradual smooth boundary.

Bw2—12 to 26 inches; pale brown (10YR 6/3) extremely gravelly sandy loam, dark brown (10YR 4/3) moist; weak very fine granular structure; soft, very friable, slightly sticky and nonplastic; common very fine roots; 70 percent angular gravel; slightly acid (pH 6.4); gradual smooth boundary.

C1—26 to 36 inches; pale brown (10YR 6/3) extremely gravelly loamy sand, dark brown (10YR 4/3) moist; single grain; loose, slightly sticky and nonplastic; few very fine roots; 80 percent angular gravel; neutral (pH 6.6); gradual smooth boundary.

C2—36 to 60 inches; very pale brown (10YR 7/4) extremely gravelly loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; 70 percent angular gravel; neutral (pH 6.8).

## ***Germangulch Series***

**Taxonomic Class:** Fine-loamy, mixed, superactive Vitrandic Haplocryalfs

### **Typical Pedon**

Germangulch cobbly ashy sandy loam (Colors are for dry soil unless otherwise noted.)

Oi—0 to 1 inches; slightly decomposed forest litter.

E—1 to 9 inches; pale brown (10YR 6/3) cobbly ashy sandy loam, brown (10YR 4/3) moist; weak fine granular structure; very friable, slightly hard, slightly sticky and slightly plastic; common fine roots; many fine interstitial and irregular pores; 2 percent stones, 10 percent cobbles, 10 percent gravel; slightly acid (pH 6.2); clear wavy boundary.

Bt—9 to 23 inches; pale brown (10YR 6/3) cobbly sandy clay loam, brown (10YR 5/3) moist; weak medium prismatic structure; friable, hard, moderately sticky



and moderately plastic; common fine roots; common fine tubular pores; common distinct clay films on faces of peds; 10 percent cobbles, 10 percent gravel; neutral (pH 6.6); clear wavy boundary.

BC—23 to 33 inches; light yellowish brown (2.5Y 6/3) gravelly sandy loam, light olive brown (2.5Y 5/3) moist; weak medium subangular blocky structure; friable, hard, slightly sticky and slightly plastic; few very fine roots; common fine irregular pores; 15 percent gravel; neutral (pH 6.8); abrupt smooth boundary.

Cr—33 to 60 inches; weakly cemented tuffaceous rhyolite.

## ***Gnojek Series***

**Taxonomic Class:** Loamy-skeletal, mixed, superactive, frigid Lithic Argiustolls

### **Typical Pedon**

Gnojek very cobbly loam, stony (Colors are for dry soil unless otherwise noted.)

A—0 to 3 inches; dark grayish brown (10YR 4/2) very cobbly loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; soft, very friable, slightly sticky and nonplastic; many very fine and fine roots; many very fine and fine interstitial pores; 25 percent cobbles, 20 percent gravel; neutral (pH 7.2); clear wavy boundary.

Bt—3 to 7 inches; dark grayish brown (10YR 4/2) very gravelly clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate fine subangular blocky; slightly hard, firm, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine interstitial and tubular pores; common distinct clay films on faces of peds and bridging sand grains; 15 percent cobbles, 35 percent gravel; slightly alkaline (pH 7.4); clear wavy boundary.

Bk—7 to 16 inches; light brownish gray (10YR 6/2) very cobbly loam, brown (10YR 5/3) moist; moderate fine subangular blocky structure; soft, friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine and fine interstitial and tubular pores; 25 percent cobbles, 30 percent gravel; disseminated lime; common medium masses and threads of lime; common distinct lime coats on rock fragments; violently effervescent; moderately alkaline (pH 8.2).

R—16 to 60 inches; hard fine-grained sandstone.

## ***Goldflint Series***

**Taxonomic Class:** Sandy-skeletal, mixed Lithic Cryorthents

### **Typical Pedon**

Goldflint loamy coarse sand (Colors are for dry soil unless otherwise noted.)

Oi—0 to 1 inch; litter layer of largely undecomposed conifer needles and twigs.

A—1 to 3 inches; brown (10YR 4/3) loamy coarse sand, very dark brown (10YR 2/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine, fine, and medium and few coarse and very coarse roots; 10 percent fine subangular gravel; slightly acid (pH 6.4); clear smooth boundary.

Bw—3 to 11 inches; yellowish brown (10YR 5/4) gravelly loamy coarse sand, dark yellowish brown (10YR 3/4) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common very fine, fine, medium, coarse, and very coarse roots; 2 percent subrounded cobbles, 25 percent fine subangular gravel; slightly acid (pH 6.4); clear smooth boundary.

BC—11 to 18 inches; variegated colors, mainly yellowish brown (10YR 5/4) and brownish yellow (10YR 6/6) very gravelly coarse sand, dark yellowish brown (10YR

4/4) moist; single grain; loose, nonsticky and nonplastic; common very fine, fine, and medium and few coarse and very coarse roots; many very fine and fine and common medium interstitial pores; 2 percent subrounded cobbles, 40 percent fine subangular gravel; neutral (pH 6.8); abrupt wavy boundary.

R—18 to 60 inches; hard granite bedrock.

## ***Gregson Series***

**Taxonomic Class:** Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Aquic Haplustolls

### **Typical Pedon**

Gregson loam (Colors are for dry soil unless otherwise noted.)

Oi—0 to 1 inch; partially decomposed organic matter.

A—1 to 9 inches; very dark grayish brown (10YR 3/2) loam, black (10YR 2/1) moist; strong fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine pores; neutral (pH 7.2); clear smooth boundary.

Bw1—9 to 19 inches; light gray (10YR 7/2) loam, grayish brown (10YR 5/2) moist; moderate fine granular structure; slightly hard, very friable; slightly sticky and slightly plastic; common very fine and fine roots; many very fine and fine pores; neutral (pH 7.2); clear smooth boundary.

Bw2—19 to 23 inches; light gray (10YR 7/2) loam, grayish brown (10YR 5/2) moist; few fine faint strong brown (7.5YR 4/6) redox concentrations; moderate fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine and fine pores; neutral (pH 7.2); clear smooth boundary. (Combined thickness of the Bw horizons is 13 to 29 inches.)

2C—23 to 60 inches; light gray (10YR 7/1) very gravelly loamy sand, grayish brown (10YR 5/2) moist; single grain; loose, nonsticky and nonplastic; few very fine and fine roots; common very fine pores; 10 percent cobbles, 40 percent gravel; neutral (pH 7.2).

## ***Highrye Series***

**Taxonomic Class:** Fine-loamy, mixed, superactive Ustic Argicryolls

### **Typical Pedon**

Highrye sandy loam (Colors are for dry soil unless otherwise noted.)

A1—0 to 3 inches; very dark grayish brown (10YR 3/2) sandy loam, black (10YR 2/1) moist; weak fine granular structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine and common medium roots; many very fine irregular pores; 5 percent fine gravel; moderately acid (pH 5.6); clear smooth boundary.

A2—3 to 11 inches; dark grayish brown (10YR 4/2) coarse sandy loam, black (10YR 2/1) moist; moderate medium subangular block structure; slightly hard, very friable, slightly sticky and nonplastic; common very fine and fine and few medium roots; common very fine irregular and few very fine and fine tubular pores; 10 percent fine gravel; slightly acid (pH 6.2); clear wavy boundary.

Bt1—11 to 23 inches; brown (10YR 5/3) gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, firm, slightly sticky and slightly plastic; common

- very fine and few fine and medium roots; common very fine and few fine tubular pores; 20 percent fine gravel; slightly acid (pH 6.4); gradual wavy boundary.
- Bt2—23 to 32 inches; yellowish brown (10YR 5/4) gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; weak coarse prismatic structure; hard, firm, slightly sticky and slightly plastic; few very fine and fine roots; few very fine tubular pores; 30 percent fine gravel; neutral (pH 6.6); gradual irregular boundary.
- BC—32 to 46 inches; yellowish brown (10YR 5/4) gravelly coarse sandy loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, very friable, slightly sticky and nonplastic; few very fine roots; common very fine irregular pores; 25 percent fine gravel; neutral (pH 6.8); gradual irregular boundary.
- C—46 to 56 inches; yellowish brown (10YR 5/4) very gravelly coarse sand, brown (10YR 4/3) moist; single grain; loose, nonsticky and nonplastic; 35 percent, mainly fine, gravel; neutral (pH 6.8); gradual wavy boundary.
- Cr—56 to 60 inches; weathered granite bedrock.

### ***Hiore Series***

**Taxonomic Class:** Loamy-skeletal, mixed, superactive Ustic Eutrocrypts

#### **Typical Pedon**

Hiore coarse sandy loam (Colors are for dry soil unless otherwise noted.)

- Oi—1 inch to 0; forest litter of partially decomposed needles and twigs.
- A1—0 to 2 inches; dark grayish brown (10YR 4/2) coarse sandy loam, very dark brown (10YR 2/2) moist; moderate very fine granular structure; soft, very friable, nonsticky and slightly plastic; common very fine and fine and few medium and coarse roots; many very fine and fine pores; 5 percent gravel; neutral (pH 7.0); abrupt smooth boundary.
- A2—2 to 7 inches; grayish brown (10YR 5/2) gravelly coarse sandy loam, dark grayish brown (10YR 4/2) moist; moderate fine granular structure; soft, very friable, nonsticky and slightly plastic; common very fine and fine and few medium and coarse roots; many very fine and fine pores; 15 percent gravel; neutral (pH 7.0); gradual smooth boundary.
- Bw1—7 to 22 inches; light brownish gray (10YR 6/2) gravelly coarse sandy loam, brown (10YR 5/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common fine and few medium roots; common fine pores; 30 percent gravel; neutral (pH 7.2); gradual smooth boundary.
- Bw2—22 to 35 inches; light gray (10YR 7/2) very gravelly loamy coarse sand, brown (10YR 5/3) moist; weak fine and medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; few fine and medium roots; 40 percent gravel; neutral (pH 7.2); gradual smooth boundary.
- BC—35 to 60 inches; light yellowish brown (10YR 6/4) extremely gravelly loamy coarse sand, yellowish brown (10YR 5/6) moist; single grain; loose, nonsticky and nonplastic; 60 percent gravel; few medium roots; neutral (pH 7.2).

### ***Hungryhill Series***

**Taxonomic Class:** Loamy-skeletal, mixed, superactive Ustic Argicryolls

#### **Typical Pedon**

Hungryhill gravelly loam (Colors are for dry soil unless otherwise noted.)

- A—0 to 7 inches; very dark grayish brown (10YR 3/2) gravelly loam, black (10YR 2/1) moist; weak fine granular structure; very friable, slightly hard, slightly sticky and moderately plastic; many very fine and fine roots; many fine tubular pores;

3 percent stones, 5 percent cobbles, 20 percent gravel; slightly acid (pH 6.4); clear wavy boundary.

Bt—7 to 17 inches; brown (10YR 5/3) very gravelly clay loam, dark brown (10YR 3/3) moist; weak medium prismatic structure; friable, hard, moderately sticky and moderately plastic; many fine roots; many fine irregular and tubular pores; common distinct clay films on faces of peds; 20 percent cobbles, 40 percent gravel; neutral (pH 6.6); gradual wavy boundary.

BC—17 to 26 inches; pale brown (10YR 6/3) very gravelly sandy clay loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; friable, hard, moderately sticky and moderately plastic; common very fine roots; common fine irregular pores; 45 percent gravel; neutral (pH 6.8); abrupt irregular boundary.

R—26 to 60 inches; indurated rhyolitic tuff.

### ***Illiano Series***

**Taxonomic Class:** Ashy-skeletal, glassy Lithic Haplocryepts

#### **Typical Pedon**

Illiano very flaggy ashy sandy loam (Colors are for dry soil unless otherwise noted.)

A—0 to 4 inches; grayish brown (10YR 5/2) very flaggy ashy sandy loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine roots; 25 percent flagstones, 30 percent gravel; slightly acid (pH 6.4); clear wavy boundary.

Bw—4 to 11 inches; light brownish gray (10YR 6/2) very flaggy ashy sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine and few medium roots; 25 percent flagstones, 30 percent gravel; neutral (pH 6.8); abrupt smooth boundary.

R—11 to 60 inches; light gray (5Y 7/1) fractured hard welded tuff bedrock.

### ***Judco Series***

**Taxonomic Class:** Loamy-skeletal, mixed, superactive Ustivitrandid Haplocryepts

#### **Typical Pedon**

Judco very gravelly ashy sandy loam (Colors are for dry soil unless otherwise noted.)

Oi—0 to 0.5 inch; partially decomposed needles, twigs, and leaves.

Oe—0.5 to 2 inches; well-decomposed needles, twigs, and leaves.

A1—2 to 4 inches; dark gray (10YR 4/1) very gravelly ashy sandy loam, very dark brown (10YR 2/2) moist; moderate medium granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine and few medium roots; 10 percent cobbles, 30 percent gravel; strongly acid (pH 5.4); clear wavy boundary.

A2—4 to 6 inches; gray (10YR 5/1) very gravelly ashy sandy loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine and few medium and coarse roots; many very fine pores; 10 percent cobbles, 30 percent gravel; moderately acid (pH 5.6); clear wavy boundary.

Bw—6 to 12 inches; yellowish brown (10YR 5/4) very gravelly ashy sandy loam, dark yellowish brown (10YR 4/4) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine and few medium and coarse roots; many very

fine pores; 10 percent cobbles, 30 percent gravel; moderately acid (pH 6.0); clear wavy boundary.

BC1—12 to 23 inches; light gray (2.5Y 7/2) very gravelly ashy sandy loam, dark grayish brown (2.5Y 4/2) moist; weak medium and coarse subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine roots; common fine pores; 10 percent cobbles, 45 percent gravel; slightly acid (pH 6.4); gradual wavy boundary.

BC2—23 to 40 inches; light gray (2.5Y 7/2) very gravelly ashy sandy clay loam, grayish brown (2.5Y 5/2) moist; weak coarse subangular blocky structure; slightly hard, very friable, nonsticky and slightly plastic; common very fine and fine and few medium roots; common fine pores; 5 percent cobbles, 45 percent gravel; neutral (pH 6.6); gradual wavy boundary. (Combined thickness of the B horizons is 24 to 40 inches.)

C—40 to 58 inches; light gray (10YR 7/2) very gravelly ashy sandy clay loam, grayish brown (2.5Y 5/2) moist; massive; slightly hard, very friable, slightly sticky and nonplastic; few very fine, fine, and medium roots; 5 percent cobbles, 45 percent gravel; neutral (pH 6.6); clear wavy boundary.

Cr—58 to 60 inches; light gray (10YR 7/2) decomposing welded tuff bedrock that crushes to very gravelly ashy sandy loam; neutral (pH 6.6).

## ***Kalsted Series***

**Taxonomic Class:** Coarse-loamy, mixed, superactive, frigid Aridic Calcustepts

### **Typical Pedon**

Kalsted sandy loam (Colors are for dry soil unless otherwise noted.)

Ap—0 to 7 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 4/3) moist; weak very fine granular structure; soft, very friable, slightly sticky and slightly plastic; common very fine roots; many very fine pores; disseminated lime; strongly effervescent; slightly alkaline (pH 7.4); abrupt smooth boundary.

Bw—7 to 11 inches; very pale brown (10YR 7/3) sandy loam, brown (10YR 5/3) moist; weak fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; many very fine pores; 5 percent gravel; disseminated lime; strongly effervescent; slightly alkaline (pH 7.5); clear wavy boundary.

Bk1—11 to 30 inches; very pale brown (10YR 8/2) sandy loam, very pale brown (10YR 7/3) moist; weak coarse prismatic structure; hard, firm, slightly sticky and slightly plastic; common very fine roots; common very fine tubular pores; 5 percent gravel; disseminated lime; continuous distinct lime coats on surfaces of gravel; violently effervescent; moderately alkaline (pH 8.2); clear wavy boundary.

Bk2—30 to 54 inches; pale brown (10YR 6/3) gravelly sandy loam, stratified with thin lenses of loamy sand, yellowish brown (10YR 5/4) moist; massive; hard, friable, slightly sticky and slightly plastic; few very fine roots; common very fine tubular pores; 20 percent gravel; continuous distinct lime coats on surfaces of gravel; many fine and medium masses of lime; violently effervescent; moderately alkaline (pH 8.0); clear wavy boundary.

BC—54 to 60 inches; pale brown (10YR 6/3) gravelly sandy loam, stratified with common thin lenses of loamy sand, yellowish brown (10YR 5/4) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine vesicular pores; 20 percent gravel; disseminated lime; strongly effervescent; moderately alkaline (pH 8.3).

## ***Kilgore Series***

**Taxonomic Class:** Fine-loamy over sandy or sandy-skeletal, mixed, superactive  
Cumulic Cryaquolls

### **Typical Pedon**

Kilgore silt loam (Colors are for dry soil unless otherwise noted.)

- A1—0 to 4 inches; very dark grayish brown (10YR 3/2) silt loam, very dark brown (10YR 2/2) moist; moderate fine granular structure; soft, very friable, slightly sticky and slightly plastic; many fine roots and pores; few fine yellowish brown (10YR 5/6) iron concentrations; neutral (pH 7.2); clear smooth boundary.
- A2—4 to 16 inches; dark gray (10YR 4/1) silt loam, very dark grayish brown (10YR 3/2) moist; moderate fine subangular blocky structure parting to moderate fine granular; soft, very friable, slightly sticky and moderately plastic; many fine roots and pores; few fine yellowish brown (10YR 5/6) iron concentrations; slightly alkaline (pH 7.4); clear smooth boundary.
- Ag—16 to 25 inches; dark gray (10YR 4/1) silt loam, very dark gray (10YR 3/1) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and moderately plastic; few fine roots; few fine yellowish brown (10YR 5/6) iron concentrations; slightly alkaline (pH 7.4); clear smooth boundary.
- 2Cg—25 to 29 inches; dark gray (10YR 4/1) very gravelly sandy loam, dark grayish brown (10YR 4/2) moist; massive; soft, friable, nonsticky and nonplastic; 5 percent cobbles, 25 percent gravel; common distinct medium yellowish brown (10YR 5/6) iron concentrations; neutral (pH 7.3); clear wavy boundary.
- 2C—29 to 60 inches; very gravelly loamy sand; single grain; loose; 15 percent cobbles, 40 percent gravel; neutral.

## ***Larkspur Series***

**Taxonomic Class:** Loamy-skeletal, mixed, superactive, nonacid Lithic Cryorthents

### **Typical Pedon**

Larkspur very cobbly coarse sandy loam (Colors are for dry soil unless otherwise noted.)

- A—0 to 3 inches; pale brown (10YR 6/3) very cobbly coarse sandy loam, brown (10YR 4/3) moist; moderate medium granular structure; very friable, slightly hard, nonsticky and nonplastic; common fine and few medium roots; many fine interstitial pores; 20 percent cobbles, 25 percent gravel; slightly acid (pH 6.4); clear smooth boundary.
- C—3 to 8 inches; light gray (10YR 7/2) very cobbly coarse sandy loam, grayish brown (10YR 5/2) moist; single grain; loose, nonsticky and nonplastic; few fine roots; common fine interstitial pores; 25 percent cobbles, 30 percent gravel; neutral (pH 6.8); abrupt irregular boundary.
- R—8 to 60 inches; fractured gray rhyolitic tuff.

## ***Libeg Series***

**Taxonomic Class:** Loamy-skeletal, mixed, superactive Ustic Argicryolls

### **Typical Pedon**

Libeg stony loam (Colors are for dry soil unless otherwise noted.)

- A—0 to 6 inches; dark grayish brown (10YR 4/2) stony loam, black (10YR 2/1) moist; weak thin platy structure parting to moderate very fine and fine granular; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine and few medium roots; many very fine and fine pores; 10 percent stones, 15 percent channers, 25 percent sandstone fragments; slightly acid (pH 6.4); clear wavy boundary.
- Bt1—6 to 11 inches; brown (10YR 5/3) very channery loam, dark brown (10YR 3/3) moist; strong very fine subangular blocky structure; hard, friable, moderately sticky and moderately plastic; many very fine and fine roots; many very fine and fine pores; pale brown (10YR 6/3) fine sand coats on some faces of peds; faint clay films on faces of some peds and on rock fragments; 35 percent channery sandstone fragments; slightly acid (pH 6.5); clear wavy boundary.
- Bt2—11 to 16 inches; brown (7.5YR 5/4) very channery clay loam, brown (7.5YR 4/4) moist; strong very fine and fine angular blocky structure; very hard, friable, moderately sticky and moderately plastic; many very fine and fine roots; many very fine and fine pores; pale brown (10YR 6/3) fine sand coats on vertical faces of peds; faint clay films on faces of some peds and on rock fragments; 40 percent sandstone fragments; slightly acid (pH 6.5); clear wavy boundary.
- Bt3—16 to 30 inches; reddish brown (5YR 5/4) extremely channery sandy clay loam, reddish brown (5YR 4/4) moist; strong fine and medium angular blocky structure; extremely hard, friable, moderately sticky and moderately plastic; common very fine and fine and few coarse roots; many very fine and fine and few medium pores; distinct continuous clay films on all faces of peds and on rock fragments; 60 percent channers; slightly acid (pH 6.2); gradual irregular boundary.
- BC—30 to 60 inches; light reddish brown (5YR 6/4) extremely stony sandy loam, yellowish red (5YR 5/6) moist; weak fine and medium subangular blocky structure; very hard, friable, moderately sticky and moderately plastic; few very fine and fine roots; common very fine and fine pores; 50 percent stones, 30 percent angular gravel; 80 percent sandstone fragments; slightly acid (pH 6.5).

## ***Loberg Series***

**Taxonomic Class:** Clayey-skeletal, mixed, superactive Ustic Glossocryalfs

### **Typical Pedon**

Loberg gravelly clay loam, stony (Colors are for dry soil unless otherwise noted.)

- Oi—0 to 2 inches; forest litter and humus.
- E—2 to 5 inches; light brownish gray (10YR 6/2) gravelly clay loam, dark brown (7.5YR 3/2) moist; weak thick platy structure parting to moderate fine granular; soft, friable, slightly sticky and slightly plastic; many very fine and fine roots; sand grains are clear and unstained; 10 percent cobbles, 15 percent gravel; 0.05 percent stones on surface; strongly acid (pH 5.1); clear wavy boundary.
- E/Bt—5 to 14 inches; E part (75 percent) is light brownish gray (10YR 6/2) stony loam, dark brown (7.5YR 3/3) moist tongues; Bt part (25 percent) is pale brown (10YR 6/3) stony clay, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure parting to moderate fine granular; hard, friable, slightly sticky and slightly plastic; many fine roots; continuous distinct clay films on faces of peds that are coated with clear unstained sand grains; 10 percent stones, 5 percent cobbles, 15 percent gravel; strongly acid (pH 5.2); clear wavy boundary.
- Bt1—14 to 29 inches; pale brown (10YR 6/3) very stony clay, dark brown (10YR 3/3) moist; strong fine and medium blocky structure; very hard, firm, very sticky and very plastic; continuous prominent clay films on faces of peds; continuous prominent clay films on gravel surfaces; common fine roots; 10 percent stones,

10 percent cobbles, 20 percent gravel; moderately acid (pH 5.6); gradual wavy boundary.

Bt2—29 to 51 inches; pale brown (10YR 6/3) very stony clay, dark brown (10YR 3/3) moist; strong fine and medium blocky structure parting to moderate medium blocky in lower part; very hard, firm, very sticky and very plastic; common fine roots; continuous prominent clay films on faces of peds; continuous prominent clay films on surfaces of gravel; 10 percent stones, 10 percent cobbles, 20 percent gravel; slightly acid (pH 6.4); gradual wavy boundary.

Bt3—51 to 68 inches; grayish brown (10YR 5/2) very cobbly clay, dark grayish brown (10YR 4/2) moist; very weak fine and medium blocky structure; very hard, firm, very sticky and very plastic; common fine roots; common faint clay films on faces of peds; common distinct clay films on surfaces of gravel; 10 percent stones, 15 percent cobbles, 25 percent gravel; slightly alkaline (pH 7.4); abrupt smooth boundary.

BC—68 to 72 inches; dark grayish brown (10YR 5/2) very stony clay, very dark grayish brown (10YR 3/2) moist; massive; very hard, firm, very sticky and very plastic; continuous faint clay films on surfaces of gravel; 10 percent stones, 5 percent cobbles, 25 percent gravel; few fine pores; slightly alkaline (pH 7.8).

## ***Mannixlee Series***

**Taxonomic Class:** Fine-loamy, mixed, superactive, frigid Cumulic Endoaquolls

### **Typical Pedon**

Mannixlee clay loam (Colors are for moist soil unless otherwise noted.)

Oi—0 to 2 inches; partially decomposed organic matter.

A1—2 to 9 inches; very dark gray (10YR 3/1) clay loam, dark gray (10YR 4/1) dry; common medium distinct dark brown (7.5YR 4/4) redox concentrations; moderate medium granular structure; hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine tubular and discontinuous irregular pores; neutral (pH 7.2); gradual smooth boundary.

A2—9 to 16 inches; very dark gray (10YR 3/1) clay loam, dark gray (10YR 4/1) dry; moderate medium subangular blocky structure; very hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine discontinuous irregular and common very fine tubular pores; neutral (pH 7.2); gradual smooth boundary.

A3—16 to 25 inches; very dark gray (10YR 3/1) loam, dark gray (10YR 4/1) dry; common medium distinct dark brown (7.5YR 4/4) redox concentrations; moderate medium subangular blocky structure; very hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; few fine tubular and few very fine and fine discontinuous irregular pores; neutral; (pH 7.2); gradual smooth boundary.

Bw—25 to 45 inches; very dark gray (10YR 3/1) loam, dark gray (10YR 4/1) dry; many medium distinct dark brown (7.5YR 4/4) redox concentrations; weak medium subangular blocky structure; very hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; common very fine and fine discontinuous irregular and few fine tubular pores; neutral (pH 6.6); abrupt smooth boundary.

2Cg—45 to 60 inches; grayish brown (10YR 5/2) extremely cobbly loamy coarse sand, light brownish gray (10YR 6/2) dry; single grain; loose, nonsticky and nonplastic; 35 percent cobbles; 30 percent gravel; neutral (pH 7.2).

## ***Maurice Series***

**Taxonomic Class:** Loamy-skeletal, mixed, superactive Ustic Haplocryolls



### Typical Pedon

Maurice loam, stony (Colors are for dry soil unless otherwise noted.)

- A1—0 to 3 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; very dark gray (10YR 3/1) moist coats; moderate fine granular structure; soft, friable, nonsticky and nonplastic; many very fine and fine roots; 0.05 percent stones on surface; 5 percent gravel; neutral (pH 7.2); clear smooth boundary.
- A2—3 to 13 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; black (10YR 2/1) coats, moist; weak medium prisms parting to moderate fine and medium blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; 10 percent gravel; neutral (pH 7.2); clear smooth boundary.
- Bw1—13 to 24 inches; brown (10YR 4/3) very gravelly fine sandy loam, brown (10YR 4/3) moist; weak medium prismatic structure; slightly hard, friable, nonsticky and nonplastic; common very fine roots; 10 percent cobbles, 30 percent gravel; moderately alkaline (pH 8.2); gradual wavy boundary.
- Bw2—24 to 60 inches; light brownish gray (10YR 6/2) very gravelly fine sandy loam, grayish brown (10YR 5/2) moist; weak medium prismatic structure; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; 10 percent cobbles, 40 percent gravel; slightly alkaline (pH 7.8).

### ***Mawspring Series***

**Taxonomic Class:** Loamy-skeletal, mixed, superactive Ustic Haplocryepts

### Typical Pedon

Mawspring very channery loam (Colors are for dry soil unless otherwise noted.)

- A—0 to 6 inches; dark grayish brown (10YR 4/2) very channery loam, very dark grayish brown (10YR 3/2) moist; weak very fine granular structure; soft, very friable, nonsticky and slightly plastic; many very fine and fine roots; many fine irregular pores; 35 percent channers; slightly acid (pH 6.4); clear smooth boundary.
- Bw—6 to 13 inches; light yellowish brown (10YR 6/4) very channery loam, yellowish brown (10YR 5/4) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common fine irregular pores; 45 percent channers; neutral (pH 6.6); gradual wavy boundary.
- BC—13 to 33 inches; light yellowish brown (10YR 6/4) extremely channery loam, yellowish brown (10YR 5/4) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; common fine irregular pores; 65 percent channers; neutral (pH 6.6); gradual irregular boundary.
- C—33 to 60 inches; light olive brown (2.5Y 5/4) extremely channery sandy loam, olive brown (2.5Y 4/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; common fine irregular pores; 65 percent channers; neutral (pH 6.6).

### ***Meadowcreek Series***

**Taxonomic Class:** Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Fluvaquent Haplustolls

### Typical Pedon

Meadowcreek loam (Colors are for dry soil unless otherwise noted.)

- Ap—0 to 5 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium subangular blocky structure; slightly hard, friable, moderately sticky and slightly plastic; many very fine roots; strongly effervescent; moderately alkaline (pH 8.0); abrupt smooth boundary.
- A2—5 to 10 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak medium prismatic structure parting to weak fine and medium subangular blocky; slightly hard, friable, moderately sticky and slightly plastic; common very fine roots; many fine tubular and interstitial pores; strongly effervescent; moderately alkaline (pH 8.0); clear smooth boundary.
- A3—10 to 15 inches; gray (10YR 5/1) silt loam, very dark gray (10YR 3/1) moist; weak medium prismatic structure; slightly hard, friable, moderately sticky and slightly plastic; common very fine roots; many very fine tubular and interstitial pores; slightly alkaline (pH 7.4); clear smooth boundary.
- Bg1—15 to 27 inches; light brownish gray (10YR 6/2) loam, dark grayish brown (10YR 4/2) moist; few fine distinct brown (7.5YR 5/3) moist, redox concentrations; weak coarse prismatic structure; few thin very dark grayish brown (10YR 3/2) moist layers of soil; slightly hard, friable, moderately sticky and slightly plastic; common very fine roots; many very fine tubular and interstitial pores; neutral (pH 7.0); gradual smooth boundary.
- Bg2—27 to 31 inches; gray (10YR 6/1) sandy loam, dark grayish brown (10YR 4/2) moist; common fine distinct brown (7.5YR 5/4) moist, redox concentrations; weak coarse prismatic structure; slightly hard, friable, nonsticky and moderately plastic; common very fine roots; many very fine tubular and interstitial pores; few gravel; neutral (pH 7.2); clear smooth boundary.
- 2C—31 to 60 inches; variegated colors, very gravelly sand; single grain; loose, nonsticky and nonplastic; few very fine roots; 55 percent gravel; neutral (pH 7.2).

## ***Minestope Series***

**Taxonomic Class:** Sandy-skeletal, mixed, shallow Ustic Haplocryolls

### **Typical Pedon**

Minestope gravelly coarse sandy loam (Colors are for dry soil unless otherwise noted.)

- A—0 to 7 inches; brown (10YR 4/3) gravelly coarse sandy loam, dark brown (10YR 3/3) moist; weak medium granular structure; soft, very friable, slightly sticky and nonplastic; common very fine, fine, and medium roots; 15 percent fine subangular pea gravel; slightly acid (pH 6.2); clear smooth boundary.
- Bw—7 to 13 inches; brown (10YR 5/3) gravelly coarse sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; common very fine and few fine and medium roots; 30 percent fine subangular pea gravel; neutral (pH 6.6); clear wavy boundary.
- BC—13 to 18 inches; light gray (10YR 7/2) very gravelly loamy coarse sand, grayish brown (10YR 5/2) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; 45 percent fine subangular pea gravel; neutral (pH 6.6); clear wavy boundary.
- Cr—18 to 23 inches; soft weathered granite bedrock.
- R—23 to 60 inches; hard granite bedrock.

## ***Modess Series***

**Taxonomic Class:** Coarse-loamy, mixed, superactive, frigid Aridic Haplustolls

### Typical Pedon

Modess sandy loam (Colors are for dry soil unless otherwise noted.)

- A1—0 to 5 inches; dark grayish brown (10YR 4/2) sandy loam, very dark brown (10YR 2/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and common fine and medium roots; 10 percent, mainly fine, gravel; moderately acid (pH 6.0); clear smooth boundary.
- A2—5 to 11 inches; dark brown (10YR 3/3) gravelly sandy clay loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; slightly hard, friable, moderately sticky and slightly plastic; common very fine and fine and few medium roots; few very fine and fine tubular pores; 20 percent, mainly fine, gravel; neutral (pH 6.8); clear wavy boundary.
- Bw—11 to 18 inches; yellowish brown (10YR 5/4) gravelly coarse sandy loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and few fine and medium roots; few very fine tubular pores; 20 percent, mainly fine, gravel; neutral (pH 7.0); abrupt wavy boundary.
- Bk—18 to 30 inches; pale brown (10YR 6/3) gravelly coarse sandy loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine and fine roots; 30 percent, mainly fine, gravel; disseminated lime; violently effervescent; moderately alkaline (pH 8.2); gradual wavy boundary.
- BC—30 to 38 inches; light brownish gray (2.5Y 6/2) gravelly coarse sand, olive brown (2.5Y 4/3) moist; single grain; loose, nonsticky and nonplastic; many very fine and few fine interstitial pores; 30 percent, mainly fine, gravel; slightly effervescent; moderately alkaline (pH 8.2); abrupt wavy boundary.
- Cr—38 to 58 inches; soft, weathered granite bedrock.
- R—58 to 60 inches; hard granite bedrock.

### *Monaberg Taxadjunct*

**Taxonomic Class:** Fine-loamy, mixed, superactive Oxyaquic Argicryolls

### Typical Pedon

Monaberg, wet, loam (Colors are for dry soil unless otherwise noted.)

- A1—0 to 10 inches; dark grayish brown (10YR 4/1), loam, very dark brown (10YR 2/1) moist; moderate fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine interstitial pores; 2 percent stones, 5 percent cobbles, 5 percent gravel; neutral (pH 7.0); gradual smooth boundary.
- Bt—10 to 28 inches; brown (10YR 5/3), gravelly sandy clay loam, brown (10YR 4/3) moist; moderate coarse subangular blocky structure; hard, firm, moderately sticky and moderately plastic; common fine and medium roots; common very fine and fine tubular pores; 10 percent faint clay films on faces of peds; 2 percent stones, 5 percent cobbles, 15 percent gravel; neutral (pH 7.2); gradual smooth boundary.
- C—28 to 60 inches; light brownish gray (10YR 6/2), gravelly sandy clay loam, dark grayish brown (10YR 4/2) moist; massive; hard, firm, slightly sticky and slightly plastic; common fine and medium roots; common very fine and fine tubular pores; 2 percent stones, 5 percent cobbles, 20 percent gravel; few medium and coarse prominent yellowish brown (10YR 5/8) redox concentrations; slightly alkaline (pH 7.4).

## ***Monad Series***

**Taxonomic Class:** Fine-loamy, mixed, superactive Alfic Argicryolls

### **Typical Pedon**

Monad loam (Colors are for dry soil unless otherwise noted.)

- A1—0 to 9 inches; very dark gray (10YR 3/1) gravelly loam, black (10YR 2/1) moist; moderate fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine and few medium roots; 15 percent cobbles and gravel; slightly acid (pH 6.2); clear wavy boundary.
- A2—9 to 14 inches; grayish brown (10YR 5/2) channery loam, very dark grayish brown (10YR 3/2) moist; moderate very fine and fine subangular blocky structure; hard, friable, moderately sticky and moderately plastic; many very fine and fine and few medium roots; many very fine and fine and few medium pores; very thin continuous gray (10YR 6/1) skeletalans coating faces of peds; 15 percent channers; moderately acid (pH 5.8); gradual wavy boundary.
- Bt/E—14 to 21 inches; Bt part (80 percent) brown (10YR 5/3) loam, brown (10YR 4/3) moist; E part (20 percent) gray (10YR 6/1) loam, dark gray (10YR 4/1) moist; weak medium prismatic structure parting to moderate fine subangular blocky structure; very hard, friable, moderately sticky and moderately plastic; common very fine and fine roots; many very fine and fine and few medium pores; very thin continuous gray (10YR 6/1) skeletalans coating continuous faint clay films on faces of peds; 10 percent sandstone channers; moderately acid (pH 5.7); clear wavy boundary.
- Bt1—21 to 49 inches; pale brown (10YR 6/3) clay loam, brown (10YR 4/3) moist; weak medium prismatic structure parting to moderate fine and medium blocky; extremely hard, firm, very sticky and moderately plastic; few very fine and fine roots; many very fine and fine and few medium pores; very thin gray (10YR 6/1) skeletalans coating continuous distinct clay films on faces of peds; 10 percent sandstone channers; moderately acid (pH 5.8); gradual wavy boundary.
- Bt2—49 to 74 inches; very pale brown (10YR 7/4) stony clay loam, brown (7.5YR 5/4) moist; strong fine and medium blocky structure; extremely hard, firm, very sticky and moderately plastic; many very fine and fine and few medium pores; continuous distinct clay films on faces of peds; 10 percent stones, 15 percent cobbles; slightly alkaline (pH 7.4).

## ***Mooseflat Series***

**Taxonomic Class:** Fine-loamy over sandy or sandy-skeletal, mixed, superactive Typic Cryaquolls

### **Typical Pedon**

Mooseflat loam (Colors are for moist soil unless otherwise noted.)

- Oe—0 to 2 inches; black (10YR 2/1) moderately decomposed plant material, very dark grayish brown (10YR 3/2) dry; neutral (pH 6.8); clear smooth boundary.
- A—2 to 10 inches; black (10YR 2/1) loam, gray (10YR 5/1) dry; many fine distinct yellowish brown (10YR 5/6) redox concentrations; moderate medium granular structure; slightly hard, friable, slightly sticky and moderately plastic; many very fine and fine roots; many very fine and fine pores; neutral (pH 7.2); clear smooth boundary.
- Bg—10 to 18 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; common fine distinct dark yellowish brown (10YR 4/6) redox concentrations; weak thin platy structure; hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; common very fine pores; neutral (pH 6.8); abrupt smooth boundary.

- 2BCg—18 to 22 inches; dark gray (10YR 4/1) loamy fine sand, light gray (10YR 7/1) dry; common fine distinct yellowish brown (10YR 5/4) redox concentrations; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; few fine roots; 5 percent gravel; neutral (pH 6.8); abrupt smooth boundary.
- 2Cg—22 to 60 inches; gray (10YR 5/1) extremely cobbly loamy sand, gray (10YR 6/1) dry; single grain; loose, nonsticky and nonplastic; 35 percent cobbles, 25 percent gravel; neutral (pH 7.2).

## ***Moosejaw Series***

**Taxonomic Class:** Coarse-loamy, mixed, superactive Cumulic Cryaquolls

### **Typical Pedon**

Moosejaw mucky peat (Colors are for moist soil unless otherwise noted.)

- Oe—0 to 5 inches; dark brown (10YR 3/3) mucky peat, brown (10YR 4/3) dry; moderately decomposed herbaceous material and trapped sediment; soft, very friable, nonsticky and nonplastic; many very fine and fine and common medium roots; moderately acid (pH 5.8); clear smooth boundary.
- Ag—5 to 24 inches; black (N 2.5/) silt loam, very dark gray (10YR 3/1) dry; moderate medium and coarse granular structure; slightly hard, friable, moderately sticky and slightly plastic; many very fine and fine, common medium, and few coarse roots; few very fine and fine tubular pores; 2 percent subrounded gravel; slightly acid (pH 6.3); clear smooth boundary.
- Cg—24 to 43 inches; black (5Y 2.5/1) stratified loam, silt loam, and sandy loam, olive gray (5Y 5/2) dry; weak coarse subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine and few medium and coarse roots; 2 percent subrounded gravel; neutral (pH 6.6); abrupt smooth boundary.
- 2C—43 to 72 inches; olive (5Y 4/4) gravelly loamy coarse sand, light yellowish brown (2.5Y 6/4) dry; single grain; loose, nonsticky and nonplastic; few very fine roots; many interstitial pores; 30 percent subangular fine gravel; few medium distinct dark gray (5Y 4/1) redox depletions; neutral (pH 7.2).

## ***Nestley Series***

**Taxonomic Class:** Sandy-skeletal, mixed, frigid Oxyaquic Haplustolls

### **Typical Pedon**

Nestley silt loam (Colors are for dry soil unless otherwise noted.)

- A1—0 to 1 inch; very dark grayish brown (10YR 3/2) silt loam, very dark brown (10YR 2/2) moist; moderate medium granular structure; slightly hard, very friable, slightly sticky and moderately plastic; many very fine and fine and few medium roots; many very fine and fine pores; slightly alkaline (pH 7.6); clear wavy boundary.
- A2—1 to 11 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and moderately plastic; many very fine and few fine roots; many very fine and few fine pores; slightly alkaline (pH 7.8); clear wavy boundary.
- Bw—11 to 16 inches; brown (10YR 5/3) fine sandy loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; common very fine pores; 5 percent gravel; slightly alkaline (pH 7.8); abrupt smooth boundary.

2C—16 to 60 inches; light brownish gray (10YR 6/2) very gravelly sand, grayish brown (10YR 5/2) moist; single grain; loose, nonsticky and nonplastic; few very fine roots in the top 12 inches; 50 percent gravel; slightly alkaline (pH 7.4).

## ***Nissler Series***

**Taxonomic Class:** Ashy, glassy Vitrandic Argicryolls

### **Typical Pedon**

Nissler gravelly ashy loam (Colors are for dry soil unless otherwise noted.)

A—0 to 9 inches; dark grayish brown (10YR 4/2) gravelly ashy loam, very dark brown (10YR 2/2) moist; moderate fine granular structure; very friable, soft, slightly sticky and slightly plastic; many very fine and fine and few medium roots; many fine interstitial and irregular pores; 20 percent gravel; neutral (pH 6.8); clear smooth boundary.

Bt—9 to 28 inches; yellowish brown (10YR 5/4) gravelly ashy sandy clay loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; friable, hard, moderately sticky and very plastic; common fine roots; common fine tubular pores; common distinct clay films on faces of peds; 5 percent cobbles, 20 percent gravel; neutral (pH 6.8); clear wavy boundary.

BC—28 to 60 inches; light yellowish brown (2.5Y 6/3) very gravelly ashy sandy clay loam, light olive brown (2.5Y 5/3) moist; weak coarse subangular blocky structure; friable, slightly hard, moderately sticky and slightly plastic; few fine roots; common fine irregular pores; 10 percent cobbles, 30 percent gravel; neutral (pH 7.0); abrupt smooth boundary.

R—60+ inches; indurated tuffaceous rhyolite.

## ***Nivean Series***

**Taxonomic Class:** Loamy-skeletal, mixed, superactive, frigid Lithic Haplustolls

### **Typical Pedon**

Nivean very cobbly loam (Colors are for dry soil unless otherwise noted.)

A1—0 to 2 inches; dark gray (10YR 4/1) very cobbly loam, very dark brown (10YR 2/2) moist; weak very fine and fine granular structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots; 20 percent cobbles, 15 percent gravel; slightly alkaline (pH 7.6); clear wavy boundary.

A2—2 to 7 inches; dark grayish brown (10YR 4/2) very gravelly loam, very dark brown (10YR 2/2) moist; weak medium subangular blocky structure parting to moderate very fine and fine granular; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine and few coarse roots; 10 percent cobbles, 30 percent gravel; slightly alkaline (pH 7.8); clear wavy boundary.

Bw—7 to 13 inches; grayish brown (2.5Y 5/2) very gravelly coarse sandy loam, very dark grayish brown (2.5Y 3/2) moist; moderate medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine and few medium roots; many medium tubular pores; 5 percent cobbles, 35 percent gravel; moderately alkaline (pH 8.2); clear wavy boundary.

Cr—13 to 18 inches; light gray (2.5Y 7/2) semiconsolidated welded tuff.

R—18 to 60 inches; light gray (5Y 7/1) fractured hard welded tuff bedrock.

## ***Nuley Series***

**Taxonomic Class:** Fine-loamy, mixed, superactive, frigid Calcic Argiustolls

### **Typical Pedon**

Nuley clay loam (Colors are for dry soil unless otherwise noted.)

- Ap—0 to 7 inches; grayish brown (10YR 5/2) clay loam, dark brown (10YR 3/3) moist; weak or moderate fine granular structure; soft, friable, slightly sticky and slightly plastic; many fine roots; many fine tubular and few fine interstitial pores; slightly alkaline (pH 7.6); abrupt smooth boundary.
- Bt—7 to 11 inches; brown (10YR 4/3) clay loam, dark yellowish brown (10YR 3/4) moist; moderate medium subangular blocky structure; slightly hard, friable, moderately sticky and moderately plastic; many fine roots; common fine tubular pores; many and common distinct clay films on faces of peds; slightly alkaline (pH 7.4); clear wavy boundary.
- Bk1—11 to 15 inches; light gray (10YR 7/1) sandy clay loam, yellowish brown (10YR 5/4) moist; weak medium subangular blocky structure; soft, friable, slightly sticky and slightly plastic; many and common fine roots; common, moderately few, and few fine interstitial and few fine tubular pores; 5 percent gravel; disseminated lime; violently effervescent; moderately alkaline (pH 8.0); abrupt smooth boundary.
- Bk2—15 to 24 inches; white (10YR 8/1) sandy loam, light gray (10YR 7/2) moist; massive; slightly hard, friable, nonsticky and nonplastic; many and common fine roots; common fine tubular pores; 5 percent gravel; disseminated lime; violently effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary.
- 2C—24 to 50 inches; grayish brown (2.5Y 5/2) gravelly coarse sand, dark grayish brown (2.5Y 4/2) moist; single grain; loose, nonsticky and nonplastic; very few very fine roots; common fine and medium interstitial pores; 25 percent gravel; moderately effervescent; moderately alkaline (pH 8.2); gradual irregular boundary.
- R—50 to 60 inches; granitic gneiss bedrock.

## ***Oro Fino Series***

**Taxonomic Class:** Fine-loamy, mixed, superactive Calcic Argicryolls

### **Typical Pedon**

Oro Fino gravelly loam (Colors are for dry soil unless otherwise noted.)

- A1—0 to 4 inches; dark grayish brown (10YR 4/2) gravelly loam, very dark brown (10YR 2/2) moist; weak medium platy structure parting to weak fine granular; soft, very friable, nonsticky and slightly plastic; many fine roots; many fine vesicular and tubular pores; 20 percent gravel; neutral (pH 6.8); clear smooth boundary.
- A2—4 to 10 inches; dark grayish brown (10YR 4/2) gravelly loam, very dark brown (10YR 2/2) moist; moderate very coarse prismatic structure parting to weak medium subangular blocky; hard, friable, slightly sticky and slightly plastic; common fine roots; common fine irregular and few fine vesicular and tubular pores; 15 percent gravel; neutral (pH 6.8); clear smooth boundary.
- Bt—10 to 22 inches; brown (10YR 5/3) gravelly sandy clay loam, brown (10YR 4/3) moist; strong very coarse prismatic structure parting to moderate fine subangular blocky; hard, firm, slightly sticky and moderately plastic; common fine roots; common fine irregular and few fine vesicular and tubular pores; common faint clay skins as bridges between sand grains; 15 percent gravel; neutral (pH 7.2); clear smooth boundary.
- Bk1—22 to 34 inches; light gray (10YR 7/2) gravelly loam, light brownish gray (10YR 6/2) moist; massive; slightly hard, friable, nonsticky and nonplastic; common

fine roots; 30 percent gravel; many soft masses of lime; violently effervescent; moderately alkaline (pH 7.9); abrupt wavy boundary.

Bk2—34 to 42 inches; brown (10YR 5/3) very gravelly sandy loam, brown (10YR 5/3) moist; massive; loose, nonsticky and nonplastic; few fine roots; common fine irregular pores; 40 percent gravel; common soft masses of lime; strongly effervescent; slightly alkaline (pH 7.6); clear wavy boundary.

Bk3—42 to 60 inches; brown (10YR 5/3) extremely gravelly loamy sand, brown (10YR 4/3) moist; single grain; loose, nonsticky and nonplastic; few fine roots in cracks; few fine irregular pores; 60 percent gravel; common soft masses of lime; strongly effervescent; slightly alkaline (pH 7.6).

## ***Pappascreek Series***

**Taxonomic Class:** Coarse-loamy, mixed, superactive Aquic Cumulic Haplocryolls

### **Typical Pedon**

Pappascreek mucky peat (Colors are for dry soil unless otherwise noted.)

Oe—0 to 3 inches; brown (10YR 5/3) mucky peat, very dark grayish brown (10YR 3/2) moist; moderately decomposed herbaceous material and fine-grained sediment; massive; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine and common medium roots; moderately acid (pH 5.6); clear smooth boundary.

A1—3 to 18 inches; olive gray (5Y 4/2) loam, very dark gray (5Y 3/1) moist; moderate medium granular structure; slightly hard, friable, moderately sticky and slightly plastic; many very fine and common fine and medium roots; 1 percent fine subangular gravel, slightly acid (pH 6.4); gradual smooth boundary.

A2—18 to 27 inches; dark grayish brown (2.5Y 4/2) loam with several thin strata of gravelly coarse sand, very dark grayish brown (2.5Y 3/2) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine and few medium roots; few very fine and fine tubular pores; common fine distinct yellowish brown (10YR 5/6) redox concentrations; 10 percent fine subangular gravel; neutral (pH 6.8); gradual wavy boundary.

Cg—27 to 72 inches; gray (5Y 5/1) sandy loam with strata of gravelly coarse sand, dark gray (5Y 4/1) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; 5 percent fine gravel; neutral (pH 7.0).

## ***Passcreek Series***

**Taxonomic Class:** Fine-loamy, mixed, superactive Ustic Argicryolls

### **Typical Pedon**

Passcreek loam (Colors are for dry soil unless otherwise noted.)

A—0 to 4 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; strong very fine granular structure; slightly hard, very friable, slightly sticky and nonplastic; common very fine and fine roots; 5 percent sandstone channers; neutral (pH 7.0); gradual smooth boundary.

Bt—4 to 11 inches; brown (10YR 5/3) clay loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; hard, very friable, moderately sticky and moderately plastic; common fine and few very fine roots; many prominent clay films on faces of peds and in root channels; 5 percent sandstone channers; neutral (pH 7.2); clear smooth boundary.

Btk—11 to 14 inches; brown (10YR 5/3) loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; hard, friable, moderately sticky and slightly plastic; few fine roots; common distinct and few prominent clay films on faces of



pedes; slightly effervescent; calcium carbonate mainly as coats on bottom sides of channers; 5 percent sandstone channers; slightly alkaline (pH 7.8); clear smooth boundary.

Bk—14 to 23 inches; light brownish gray (10YR 6/2) channery loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, very friable, slightly sticky and nonplastic; violently effervescent, calcium carbonate as common soft masses, seams, and filaments and as coats on channers; 20 percent sandstone channers; moderately alkaline (pH 8.2); abrupt wavy boundary.

R—23 to 60 inches; hard, buff-colored, calcareous sandstone many feet thick.

## ***Passmore Series***

**Taxonomic Class:** Coarse-loamy, mixed, superactive, frigid Oxyaquic Haplustolls

### **Typical Pedon**

Passmore mucky peat (Colors are for dry soil unless otherwise noted.)

Oe—0 to 2 inches; very dark grayish brown (10YR 3/2) mucky peat, very dark brown (10YR 2/2) moist; moderately decomposed herbaceous material and fine-grained sediment; soft, very friable, nonsticky and nonplastic; many very fine and fine and common medium roots; slightly alkaline (pH 7.6), clear smooth boundary.

A1—2 to 10 inches; very dark gray (10YR 3/1) loam, black (10YR 2/1) moist; weak fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and common fine and medium roots; few very fine and fine tubular pores; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

A2—10 to 15 inches; very dark grayish brown (10YR 3/2) loam, black (10YR 2/1) moist; moderate fine and medium granular structure; moderately hard, friable, moderately sticky and slightly plastic; common very fine and fine and few medium roots; few very fine tubular pores; slightly effervescent; moderately alkaline (pH 8.2); gradual smooth boundary.

Bw—15 to 24 inches; yellowish brown (10YR 5/4) sandy loam, dark yellowish brown (10YR 3/4) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; few very fine tubular pores; 2 percent subrounded gravel; slightly alkaline (pH 7.6); gradual smooth boundary.

BC—24 to 34 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; 2 percent fine subangular gravel; few fine dark yellowish brown (10YR 4/6) redox concentrations; slightly alkaline (pH 7.4); gradual wavy boundary.

2C—34 to 72 inches; variegated pale brown (10YR 6/3) and light gray (10YR 7/2) very gravelly coarse sand, dark yellowish brown (10YR 4/4) moist; single grain; loose, nonsticky and nonplastic; many interstitial pores; 35 percent, mainly fine, gravel; neutral (pH 7.0).

## ***Patouza Series***

**Taxonomic Class:** Fine, smectitic, frigid Torreritic Argiustolls

### **Typical Pedon**

Patouza clay (Colors are for dry soil unless otherwise noted.)

Ap—0 to 4 inches; grayish brown (10YR 5/2) clay, very dark grayish brown (10YR 3/2) moist; strong fine granular structure; slightly hard, friable, moderately sticky and moderately plastic; many very fine and fine and common medium roots; neutral (pH 7.2); clear wavy boundary.

- Bt1—4 to 11 inches; grayish brown (10YR 5/2) clay, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate fine subangular blocky; slightly hard, friable, moderately sticky and moderately plastic; common very fine and fine and few medium roots; common distinct clay films on faces of peds and lining pores; few slickensides; neutral (pH 7.2); clear wavy boundary.
- Bt2—11 to 16 inches; pale brown (10YR 6/3) clay, grayish brown (10YR 5/2) moist; moderate medium prismatic structure parting to moderate fine subangular blocky; slightly hard, friable, moderately sticky and moderately plastic; few very fine, fine, and medium roots; common distinct clay films on faces of peds and lining pores; few slickensides; slightly effervescent; moderately alkaline (pH 8.3); clear wavy boundary.
- Btk—16 to 24 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; slightly hard, friable, moderately sticky and moderately plastic; few very fine, fine, and medium roots; few distinct clay films on faces of peds and lining pores; common fine masses and seams of lime; strongly effervescent; moderately alkaline (pH 8.3); clear wavy boundary.
- Bk—24 to 60 inches; pale brown (10YR 6/3) stratified silty clay loam and fine sandy loam, brown (10YR 5/3) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few very fine roots; few fine masses and seams of lime; strongly effervescent; moderately alkaline (pH 8.3).

## ***Peeler Series***

**Taxonomic Class:** Fine-loamy, mixed, superactive Ustic Glossocryalfs

### **Typical Pedon**

Peeler gravelly sandy loam (Colors are for dry soil unless otherwise noted.)

- Oi—0 to 2 inches; undecomposed organic material consisting mainly of needles, bark, and twigs.
- Oe—2 to 3 inches; partially decomposed organic material like that of the horizon above.
- E—3 to 11 inches; light brownish gray (10YR 6/2) gravelly coarse sandy loam, grayish brown (10YR 5/2) moist; weak thin platy structure parting to weak fine granular; soft, very friable, nonsticky and nonplastic; 15 percent gravel, mostly fine angular granite fragments; slightly acid (pH 6.2); gradual wavy boundary.
- E/B—11 to 19 inches; E part is light brownish gray (10YR 6/2) gravelly coarse sandy loam, grayish brown (10YR 5/2) moist; B part is brown (7.5YR 5/4) gravelly coarse sandy clay loam, brown (7.5YR 4/4) moist; weak fine subangular blocky structure parting to weak medium granular; slightly hard, very friable, nonsticky and nonplastic; clay films on some faces of peds and in some root channels and pores; the horizon consists of seams and nodules of material like that of the underlying horizon embedded in a lighter-colored matrix like that of the overlying horizon; 15 percent fine angular granite gravel; slightly acid (pH 6.4); gradual wavy boundary.
- Bt—19 to 35 inches; brown (7.5YR 5/4) gravelly coarse sandy clay loam, brown (7.5YR 4/4) moist; moderate fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; nearly continuous clay films on faces of peds and fillings in root channels and pores; 25 percent fine angular gravel; slightly acid (pH 6.4); gradual wavy boundary.
- BCt—35 to 43 inches; brown (7.5YR 5/4) gravelly coarse sandy loam, brown (7.5YR 5/4) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; extremely hard, very friable, slightly sticky and slightly plastic; few faint clay films on some faces of peds and in some root channels and

pores; 25 percent fine angular granite gravel; slightly acid (pH 6.4); gradual wavy boundary.

C—43 to 63 inches; light brown (7.5YR 6/4) gravelly coarse sandy loam, brown (7.5YR 5/4) moist; massive; extremely hard, very friable, nonsticky and nonplastic; 25 percent angular granite gravel; neutral (pH 6.6).

## ***Pensore Series***

**Taxonomic Class:** Loamy-skeletal, carbonatic, frigid Lithic Calcicusteps

### **Typical Pedon**

Pensore gravelly loam (Colors are for dry soil unless otherwise noted.)

A—0 to 4 inches; grayish brown (10YR 5/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate very fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots; 20 percent angular gravel; disseminated lime; strongly effervescent; moderately alkaline (pH 8.0); clear smooth boundary.

Bk—4 to 15 inches; light gray (10YR 7/2) extremely gravelly loam, pale brown (10YR 6/3) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; many very fine tubular and interstitial pores; 15 percent angular cobbles, 45 percent angular gravel; disseminated lime; continuous faint lime coats on top sides of coarse fragments; continuous prominent lime casts on undersides of coarse fragments; violently effervescent; moderately alkaline (pH 8.2); gradual wavy boundary.

R—15 to 60 inches; hard limestone bedrock with a few fractures; few very fine roots in fractures.

## ***Philipsburg Series***

**Taxonomic Class:** Fine-loamy, mixed, superactive Calcic Argicryolls

### **Typical Pedon**

Philipsburg silt loam (Colors are for dry soil unless otherwise noted.)

A1—0 to 5 inches; dark grayish brown (10YR 4/2) silt loam, black (10YR 2/1) moist; weak fine and medium subangular blocky structure parting to weak very fine and fine granular; soft, very friable, slightly sticky and slightly plastic; many very fine and few fine roots; many very fine and fine dendritic tubular pores; 10 percent gravel; neutral (pH 6.8); clear wavy boundary.

A2—5 to 14 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak medium prismatic structure parting to moderate fine and medium granular; slightly hard, friable, slightly sticky and slightly plastic; many very fine and few fine roots; many very fine and fine dendritic tubular pores; 10 percent gravel; neutral (pH 6.7); clear wavy boundary.

Bt1—14 to 20 inches; brown (10YR 5/3), silty clay loam, brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, friable, moderately sticky and moderately plastic; common very fine and few fine roots; common very fine and few fine dendritic tubular pores; many distinct patchy clay films on faces of peds; 10 percent gravel; neutral (pH 7.0); clear wavy boundary.

Bt2—20 to 32 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; strong medium subangular blocky structure; slightly hard, friable, moderately sticky and slightly plastic; common very fine and few fine roots;

- common very fine and few fine dendritic tubular pores; common distinct patchy clay films on faces of peds; 10 percent gravel; neutral (pH 6.8); gradual wavy boundary.
- Bk1—32 to 43 inches; very pale brown (10YR 8/4), gravelly loam, very pale brown (10YR 7/4) moist; weak fine and medium subangular blocky structure parting to weak very fine and fine granular; soft, very friable, slightly sticky and slightly plastic; few very fine roots; common very fine irregular pores; 25 percent gravel; disseminated lime; common fine and medium soft masses of lime; many distinct continuous lime coats on rock fragments; violently effervescent; moderately alkaline (pH 8.2); clear wavy boundary.
- Bk2—43 to 60 inches; very pale brown (10YR 8/3), very gravelly sandy loam, very pale brown (10YR 7/3) moist; weak very fine and fine granular structure; soft, very friable, slightly sticky and nonplastic; few very fine roots; common very fine irregular pores; 15 percent cobbles, 35 percent gravel; disseminated lime; common fine and medium soft masses of lime; many distinct continuous lime coats on rock fragments; violently effervescent; moderately alkaline (pH 8.0).

## ***Pitchstone Series***

**Taxonomic Class:** Coarse-loamy, mixed, superactive, frigid Aridic Haplustolls

### **Typical Pedon**

Pitchstone coarse sandy loam (Colors are for dry soil unless otherwise noted.)

- A—0 to 5 inches; dark grayish brown (10YR 4/2) coarse sandy loam, very dark brown (10YR 2/2) moist; weak fine and medium granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine and common medium roots; 5 percent, mainly fine, gravel; moderately acid (pH 6.0); clear smooth boundary.
- Bw—5 to 12 inches; brown (10YR 5/3) gravelly coarse sandy loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine and few medium roots; few very fine tubular pores; 15 percent, mainly fine, gravel; neutral (pH 6.6); clear smooth boundary.
- BC—12 to 27 inches; pale brown (10YR 6/3) gravelly coarse sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; 20 percent, mainly fine, gravel; neutral (pH 7.2); gradual smooth boundary.
- C1—27 to 40 inches; light brownish gray (2.5Y 6/2) gravelly loamy coarse sand, grayish brown (2.5Y 5/2) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; many very fine and fine interstitial pores; 25 percent, mainly fine, gravel; slightly alkaline (pH 7.4); gradual smooth boundary.
- C2—40 to 60 inches; light olive gray (5Y 6/2) gravelly coarse sand, olive gray (5Y 5/2) moist; single grain; loose, nonsticky and nonplastic; many very fine and fine interstitial pores; 30 percent, mainly fine, gravel; slightly alkaline (pH 7.4).

## ***Poin Series***

**Taxonomic Class:** Loamy-skeletal, mixed, superactive Lithic Haplocryolls

### **Typical Pedon**

Poin very flaggy sandy loam (Colors are for dry soil unless otherwise noted.)

- A—0 to 5 inches; grayish brown (10YR 5/2) very flaggy sandy loam, very dark brown (10YR 2/2) moist; moderate very fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; common very fine and fine

tubular pores; 15 percent flagstones, 25 percent channers; neutral (pH 7.2); abrupt wavy boundary.

Bw1—5 to 12 inches; brown (10YR 5/3) very channery sandy loam, brown (10YR 4/3) moist; weak very fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; common very fine and fine tubular pores; 15 percent flagstones, 45 percent channers; neutral (pH 7.2); clear smooth boundary.

Bw2—12 to 19 inches; pale brown (10YR 6/3) extremely flaggy sandy loam, brown (10YR 5/3) moist; weak very fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; 60 percent flagstones, 20 percent channers; neutral (pH 7.3); gradual irregular boundary.

R—19 to 60 inches; fractured gneiss-schist bedrock; few fine roots in some cracks.

### ***Quincreek Taxadjunct***

**Taxonomic Class:** Loamy-skeletal, mixed, superactive, frigid Aridic Argiustolls

#### **Typical Pedon**

Quincreek gravelly loam (Colors are for dry soil unless otherwise noted.)

A—0 to 3 inches; grayish brown (10YR 5/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; soft, friable, slightly sticky and nonplastic; common very fine and fine roots; common very fine and fine interstitial pores; 20 percent gravel; neutral (pH 7.2); clear wavy boundary.

Bt—3 to 9 inches; dark grayish brown (10YR 4/2) channery clay loam, very dark grayish brown (10YR 3/2) moist; strong medium prismatic structure; hard, firm, moderately sticky and moderately plastic; many very fine and fine roots; common very fine and fine interstitial and tubular pores; common distinct brown (7.5YR 4/2) clay films on faces of peds; 20 percent channers; neutral (pH 7.2); gradual wavy boundary.

Bk1—9 to 19 inches; light brownish gray (10YR 6/2) very channery loam, grayish brown (10YR 5/2) moist; moderate coarse subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine interstitial and tubular pores; 40 percent channers; disseminated lime, common fine masses and threads of lime; violently effervescent; moderately alkaline (pH 8.2); gradual wavy boundary.

Bk2—19 to 27 inches; grayish brown (10YR 5/2) very channery loam, dark grayish brown (10YR 4/2) moist; weak coarse subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; common very fine interstitial and tubular pores; 55 percent channers; disseminated lime, common fine masses of lime; violently effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary.

R—27 to 60 inches; reddish brown (5YR 4/3) strongly cemented bedrock.

### ***Ratiopeak Series***

**Taxonomic Class:** Loamy-skeletal, mixed, superactive Ustic Argicryolls

#### **Typical Pedon**

Ratiopeak gravelly loam, bouldery (Colors are for dry soil unless otherwise noted.)

A1—0 to 3 inches; very dark grayish brown (10YR 3/2) gravelly loam, black (10YR 2/1) moist; moderate fine subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots; many very fine and fine interstitial pores; 20 percent gravel; slightly acid (pH 6.4); clear wavy boundary.

- A2—3 to 10 inches; very dark grayish brown (10YR 3/2) gravelly loam, very dark brown (10YR 2/2) moist; strong medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots; many very fine and fine interstitial and tubular pores; 25 percent gravel; neutral (pH 6.6); clear wavy boundary.
- Bt1—10 to 15 inches; brown (10YR 4/3) very gravelly clay loam, dark brown (10YR 3/3) moist; strong medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine and few medium pores; common faint dark grayish brown (10YR 4/2) clay films on faces of peds; 40 percent gravel; neutral (pH 7.0); gradual wavy boundary.
- Bt2—15 to 26 inches; pale brown (10YR 6/3) very gravelly clay loam, brown (10YR 5/3) moist; strong medium prismatic structure parting to moderate medium subangular blocky; hard, firm, moderately sticky and moderately plastic; many very fine and fine and few medium roots; many very fine and fine interstitial and tubular pores; common distinct grayish brown (10YR 5/2) clay films on faces of peds; 40 percent gravel; neutral (pH 7.2); gradual wavy boundary.
- Bt3—26 to 35 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 5/3) moist; moderate coarse prismatic structure; hard, firm, moderately sticky and moderately plastic; common very fine and fine roots; common very fine and fine and few medium pores; few distinct clay films on faces of peds; 45 percent gravel; slightly alkaline (pH 7.8); gradual smooth boundary.
- Bk—35 to 60 inches; very pale brown (10YR 7/3) very gravelly loam, yellowish brown (10YR 5/4) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; common very fine and fine interstitial and tubular pores; 5 percent cobbles, 50 percent gravel; common fine masses and threads of lime; common distinct lime casts on undersides of rock fragments; strongly effervescent; moderately alkaline (pH 8.3).

## ***Raynesford Series***

**Taxonomic Class:** Fine-loamy, carbonatic Calcic Haplocryolls

### **Typical Pedon**

Raynesford loam (Colors are for dry soil unless otherwise noted.)

- A1—0 to 12 inches, very dark gray (10YR 3/1) loam, black (10YR 2/1) moist; strong fine and medium granular structure; slightly hard, very friable, slightly sticky and nonplastic; many fine roots; many fine and medium interstitial pores; 5 percent limestone gravel; slightly alkaline (pH 7.4); clear wavy boundary.
- A2—12 to 16 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; moderate fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine interstitial and common fine tubular pores; 5 percent limestone gravel; strongly effervescent; moderately alkaline (pH 8.2); abrupt wavy boundary.
- Bk1—16 to 28 inches, very pale brown (10YR 8/2) clay loam, light brownish gray (10YR 6/2) moist; weak fine subangular blocky structure; hard, very friable, moderately sticky and slightly plastic; many very fine and fine roots; many very fine and fine and few medium interstitial and tubular pores; 5 percent limestone gravel; many medium masses of lime; many prominent lime crusts on gravel; violently effervescent; moderately alkaline (pH 8.3); diffuse wavy boundary.
- Bk2—28 to 50 inches, very pale brown (10YR 8/3) gravelly clay loam, light brownish gray (10YR 6/2) moist; massive; very hard, very friable, moderately sticky and slightly plastic; common very fine and fine roots; many very fine and fine tubular pores; 25 percent limestone gravel; many fine, medium, or coarse masses of lime;

3 prominent lime crusts on gravel; violently effervescent; moderately alkaline (pH 8.3); diffuse wavy boundary.

Bk3—50 to 66 inches, very pale brown (10YR 7/3) gravelly clay loam, brown (10YR 5/3) moist; massive; hard, very friable, slightly sticky and nonplastic; 30 percent limestone gravel; common distinct lime crusts on gravel; violently effervescent; moderately alkaline (pH 8.3).

## ***Redchief Series***

**Taxonomic Class:** Clayey-skeletal, smectitic Ustic Argicryolls

### **Typical Pedon**

Redchief gravelly loam (Colors are for dry soil unless otherwise noted.)

A—0 to 10 inches; very dark grayish brown (10YR 3/2) gravelly loam, very dark brown (10YR 2/2) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine and common medium roots; many very fine and fine interstitial pores; 5 percent cobbles, 20 percent gravel; moderately acid (pH 5.6); clear wavy boundary.

Bt1—10 to 18 inches; yellowish brown (10YR 5/4) very gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; hard, friable, slightly sticky and moderately plastic; common very fine and fine and few medium and coarse roots; many very fine, fine, and medium interstitial pores; many faint clay films of faces of peds; 15 percent cobbles, 35 percent gravel; slightly acid (pH 6.1); clear wavy boundary.

Bt2—18 to 28 inches; light yellowish brown (10YR 6/4) very gravelly clay loam, yellowish brown (10YR 5/4) moist; moderate medium subangular blocky structure; very hard, friable, moderately sticky and moderately plastic; few very fine and fine roots; common very fine and fine interstitial pores; many faint clay films on faces of peds; 20 percent cobbles, 35 percent gravel; neutral (pH 6.6); gradual wavy boundary.

Bt3—28 to 60 inches; pale brown (10YR 6/3) extremely gravelly clay loam; dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; very hard, friable, moderately sticky and moderately plastic; few very fine and fine roots; few very fine and fine interstitial pores; many faint clay films on faces of peds; 20 percent cobbles, 45 percent gravel; neutral (pH 6.6).

## ***Reedpoint Series***

**Taxonomic Class:** Loamy-skeletal, mixed, superactive, frigid Aridic Lithic Haplustolls

### **Typical Pedon**

Reedpoint very channery loam (Colors are for dry soil unless otherwise noted.)

A—0 to 5 inches; brown (10YR 5/3) very channery loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; many fine pores; 38 percent sandstone channers; neutral (pH 7.2); abrupt smooth boundary.

R—5 to 60 inches; hard, noncalcareous sandstone.

## ***Rencot Series***

**Taxonomic Class:** Loamy-skeletal, mixed, superactive, frigid Lithic Calcicustepts

### **Typical Pedon**

Rencot channery loam (Colors are for dry soil unless otherwise noted.)

- A—0 to 4 inches; pale brown (10YR 6/3) channery loam, brown (10YR 5/3) moist; moderate fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine roots and pores; 20 percent channers; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.
- Bk1—4 to 14 inches; pale yellow (2.5Y 8/2) very channery loam, light brownish gray (2.5Y 6/2) moist; weak coarse blocky structure; hard, very friable, slightly sticky and slightly plastic; common fine roots and pores; 40 percent channers; common soft masses of calcium carbonate and lime casts on undersides of rock fragments; violently effervescent; moderately alkaline (pH 8.4); clear smooth boundary.
- Bk2—14 to 18 inches; pale yellow (2.5Y 7/4) extremely channery loam, light olive brown (2.5Y 5/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; 60 percent channers; violently effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary.
- R—18 to 60 inches; fractured hard argillite bedrock.

### ***Riverrun Series***

**Taxonomic Class:** Sandy-skeletal, mixed, frigid Oxyaquic Ustifluvents

### **Typical Pedon**

Riverrun gravelly sandy loam (Colors are for dry soil unless otherwise noted.)

- A—0 to 4 inches; dark grayish brown (10YR 4/2) gravelly sandy loam, very dark brown (10YR 2/2) moist; weak medium granular structure; slightly hard, very friable, nonsticky and nonplastic; common fine and many very fine roots; many very fine and common fine interstitial pores; 15 percent gravel; neutral (pH 6.8); abrupt smooth boundary.
- C1—4 to 9 inches; light brownish gray (10YR 6/2) gravelly loamy sand, grayish brown (10YR 5/2) moist; single grain; loose, nonsticky and nonplastic; common very fine and few fine roots; many very fine interstitial pores; 20 percent gravel; neutral (pH 7.2); clear smooth boundary.
- C2—9 to 57 inches; light brownish gray (10YR 6/2) very gravelly loamy coarse sand, grayish brown (10YR 5/2) moist; single grain; loose, nonsticky and nonplastic; few very fine and fine roots; 50 percent gravel; neutral (pH 7.2); gradual wavy boundary.
- C3—57 to 60 inches; light brownish gray (2.5Y 6/2) loamy sand, dark grayish brown (2.5Y 4/2) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; slightly alkaline (pH 7.8).

### ***Rivra Taxadjunct***

**Taxonomic Class:** Sandy, mixed, frigid Aridic Ustifluvents

### **Typical Pedon**

Rivra gravelly sandy loam (Colors are for dry soil unless otherwise noted.)

- A—0 to 8 inches, light brownish gray (2.5Y 6/2) gravelly sandy loam, dark grayish brown (2.5Y 4/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; many fine interstitial pores; 5 percent cobbles, 15 percent gravel; slightly acid (pH 6.5); clear wavy boundary.
- C1—8 to 43 inches, grayish brown (2.5Y 5/2) gravelly loamy coarse sand, dark grayish brown (2.5Y 4/2) moist; single grain; loose, nonsticky and nonplastic; common,



decreasing with increasing depth to few, very fine roots; many very fine interstitial pores; 5 percent stones, 5 percent cobbles, 20 percent gravel; neutral (pH 7.0).  
C2—43 to 60 inches, grayish brown (2.5Y 5/2) gravelly coarse sand; dark grayish brown (2.5Y 4/2) moist; single grain; loose; nonsticky and nonplastic; few very fine roots; common fine interstitial pores; 5 percent cobbles, 25 percent gravel; slightly alkaline (pH 7.6).

## ***Rockerjohn Series***

**Taxonomic Class:** Sandy, mixed, frigid Aridic Haplustolls

### **Typical Pedon**

Rockerjohn sandy loam (Colors are for dry soil unless otherwise noted.)

- A1—0 to 2 inches; grayish brown (10YR 5/2) sandy loam, very dark brown (10YR 2/2) moist; moderate very fine granular structure; soft, very friable, nonsticky and slightly plastic; many very fine and few fine and medium roots; few very fine tubular pores; 2 percent fine subangular gravel; moderately acid (pH 5.8); clear smooth boundary.
- A2—2 to 5 inches; grayish brown (10YR 5/2) sandy loam, very dark brown (10YR 2/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and few fine and medium roots; few very fine tubular pores; 2 percent fine subangular gravel; neutral (pH 6.6); clear smooth boundary.
- Bw—5 to 14 inches; light yellowish brown (10YR 6/4) coarse sandy loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and few fine and medium roots; few very fine and fine tubular pores; 10 percent fine subangular gravel; neutral (pH 7.0); clear smooth boundary.
- 2C—14 to 38 inches; variegated, mainly light gray (10YR 7/2) and light yellowish brown (10YR 6/4) gravelly coarse sand, mainly pale brown (10YR 6/3) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; many very fine and fine and common medium interstitial pores; 30 percent fine subangular gravel; slightly alkaline (pH 7.6); abrupt smooth boundary.
- 3Ck—38 to 46 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 4/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine tubular pores; 5 percent fine subangular gravel; common fine seams and threads of secondary lime; strongly effervescent; moderately alkaline (pH 8.0); clear smooth boundary.
- 4C—46 to 72 inches; pale brown (10YR 6/3) gravelly loamy sand, brown (10YR 4/3) moist; single grain; loose, nonsticky and nonplastic; many very fine and fine interstitial pores; 20 percent fine subangular gravel; slightly alkaline (pH 7.4).

## ***Rootel Series***

**Taxonomic Class:** Fine-loamy, mixed, superactive, frigid Aridic Calcustepts

### **Typical Pedon**

Rootel channery loam (Colors are for dry soil unless otherwise noted.)

- A—0 to 3 inches; grayish brown (10YR 5/2) channery loam, dark grayish brown (10YR 4/2) moist; weak thin platy structure; soft, very friable, slightly sticky and nonplastic; many very fine roots and pores; 15 percent channers; slightly effervescent; slightly alkaline (pH 7.8); clear wavy boundary.
- Bk1—3 to 7 inches; light brownish gray (10YR 6/2) channery loam, grayish brown (10YR 5/2) moist; weak fine subangular blocky structure; slightly hard, very friable,

slightly sticky and nonplastic; common fine roots and pores; 15 percent channers; continuous faint lime casts on undersides of channers; strongly effervescent; moderately alkaline (pH 8.0); clear wavy boundary.

Bk2—7 to 23 inches; white (10YR 8/2) channery loam, pale brown (10YR 6/3) moist; weak coarse prismatic structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots and pores; 15 percent channers; continuous faint lime casts on undersides of rock fragments; disseminated lime; violently effervescent; strongly alkaline (pH 8.6); abrupt wavy boundary.

R—23 to 60 inches; fractured hard calcareous argillite bedrock.

## ***Roy Series***

**Taxonomic Class:** Clayey-skeletal, mixed, superactive, frigid Typic Argiustolls

### **Typical Pedon**

Roy stony loam (Colors are for dry soil unless otherwise noted.)

A—0 to 6 inches; dark grayish brown (10YR 4/2) stony loam, very dark grayish brown (10YR 3/2) moist; weak very fine granular structure; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine pores; 10 percent stones, 5 percent gravel; neutral (pH 6.8); clear wavy boundary.

Bt1—6 to 14 inches; dark grayish brown (10YR 4/2) very stony clay loam, brown (10YR 4/3) moist; strong very fine angular blocky structure; hard, friable, moderately sticky and moderately plastic; many very fine roots; many very fine pores; continuous distinct very dark grayish brown (10YR 3/2) moist clay films on faces of peds; 20 percent stones, 15 percent cobbles, 10 percent gravel; neutral (pH 7.0); diffuse wavy boundary.

Bt2—14 to 32 inches; brown (7.5YR 5/4) very stony clay loam, brown (7.5YR 4/4) moist; strong very fine angular blocky structure; hard, firm, moderately sticky and moderately plastic; many very fine roots; many very fine pores; common distinct brown (7.5YR 4/4) clay films on faces of peds; 25 percent stones, 15 percent cobbles, 10 percent gravel; neutral (pH 7.0); clear wavy boundary.

Bk—32 to 60 inches; light yellowish brown (10YR 6/4) very stony sandy clay loam, yellowish brown (10YR 5/4) moist; fine subangular blocky structure; hard, friable, moderately sticky and slightly plastic; 25 percent stones, 15 percent cobbles, 10 percent gravel; disseminated lime; slightly effervescent; slightly alkaline (pH 7.8).

## ***Rubick Series***

**Taxonomic Class:** Loamy-skeletal, mixed, superactive Ustic Eutrocrypts

### **Typical Pedon**

Rubick cobbly coarse sandy loam, very stony (Colors are for dry soil unless otherwise noted.)

Oi—2 to 0 inches; forest litter of partially decomposed needles, twigs, and moss-covered roots.

E1—0 to 3 inches; light brownish gray (10YR 6/2) cobbly coarse sandy loam, brown (10YR 4/3) moist; moderate very fine granular structure; slightly hard, very friable, nonsticky and slightly plastic; 5 percent stones, 10 percent cobbles, 10 percent gravel; many very fine, fine, medium, and coarse roots; many very fine, fine, and medium pores; slightly acid (pH 6.4); abrupt wavy boundary.

E2—3 to 8 inches; light brownish gray (10YR 6/2) very cobbly coarse sandy loam, brown (10YR 5/3) moist; weak fine subangular blocky structure; slightly hard, very

friable, nonsticky and nonplastic; 5 percent stones, 20 percent cobbles, 15 percent gravel; many very fine, fine, and medium and common coarse roots; many very fine, fine, and medium pores; neutral (pH 7.0); clear wavy boundary.

- Bw—8 to 27 inches; pale brown (10YR 6/3) very stony coarse sandy loam, brown (10YR 5/3) moist; moderate fine and medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; 20 percent stones, 10 percent cobbles, 20 percent gravel; many very fine, fine, and medium and common coarse roots; many very fine, fine, and medium pores; neutral (pH 7.2); gradual wavy boundary.
- BC—27 to 60 inches; light gray (10YR 7/2) extremely stony loamy coarse sand, pale brown (10YR 6/3) moist; single grain; loose, nonsticky and nonplastic; 30 percent stones, 15 percent cobbles, 25 percent gravel; few fine, medium, and coarse roots; many very fine, fine, and medium pores; neutral (pH 7.0).

## ***Savenac Series***

**Taxonomic Class:** Fine, mixed, superactive Vitrandic Glossocryalfs

### **Typical Pedon**

Savenac silt loam (Colors are for dry soil unless otherwise noted.)

- Oi—0 to 0.5 inches; matted, partially decomposed organic material.
- A1—0.5 to 5 inches; very pale brown (10YR 7/3) silt loam, dark yellowish brown (10YR 4/4) moist; weak fine granular structure; soft, very friable, moderately sticky and moderately plastic; many fine roots; many fine pores; discontinuous trace of light gray silt loam just beneath O horizon; neutral; clear smooth boundary.
- A2—5 to 8 inches; very pale brown (10YR 7/4) and 15 percent light gray (10YR 7/2) silt loam, brown (7.5YR 4/4) and brown (10YR 5/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common medium roots; many fine and medium pores; neutral; abrupt smooth boundary.
- 2E—8 to 17 inches; very pale brown (10YR 8/2) and 10 percent pale brown (10YR 6/3) silt loam, light brownish gray (10YR 6/2) and brown (10YR 4/3) moist; massive; hard, firm, slightly sticky and slightly plastic; few medium roots; few fine and medium pores; moderately acid; clear smooth boundary.
- 2E/B—17 to 28 inches; white (10YR 8/1) and 40 percent yellowish brown (10YR 5/4) silty clay loam, light brownish gray (10YR 6/2) moist; strong medium and coarse prismatic structure; very hard, very firm, very sticky and very plastic; few medium roots; few medium pores; distinct patchy clay films on faces of peds and walls of cavities; organic stains on surfaces of peds; very strongly acid; abrupt smooth boundary.
- 2B/E—28 to 49 inches; pale brown (10YR 6/3), very strong brown (7.5YR 5/6) and 20 percent very pale brown (10YR 8/2) gravelly silty clay loam, yellowish brown (10YR 5/4), brown (7.5YR 5/4) and pale brown (10YR 6/3) moist; small mottles of brownish yellow (10YR 6/8); massive; hard, very firm, moderately sticky and moderately plastic; few tubular pores; distinct clay films on walls of cavities; patchy clay films on gravel; 35 percent gravel; slightly acid; gradual smooth boundary.
- 2Bt—49 to 63 inches; brown (7.5YR 5/4), pale brown (10YR 6/3), and mottles of reddish yellow (7.5YR 6/8) gravelly silty clay, brown (7.5YR 5/4), yellowish brown (10YR 5/4), and strong brown (7.5YR 5/8) moist; strong fine subangular blocky structure; very hard, very firm, very sticky and very plastic; few medium tubular pores; distinct clay films on walls of cavities; 30 percent gravel; slightly alkaline; gradual smooth boundary.

## ***Saypo Series***

**Taxonomic Class:** Fine-loamy, mixed, superactive, frigid Aquic Calciustolls

### **Typical Pedon**

Saypo clay loam (Colors are for moist soil unless otherwise noted.)

- A—0 to 7 inches; very dark brown (10YR 2/2) clay loam, dark grayish brown (10YR 4/2) dry; moderate fine and medium granular structure; slightly hard, very friable, moderately sticky and slightly plastic; many fine and medium roots; many fine and medium pores; disseminated lime; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.
- Bk1—7 to 15 inches; light brownish gray (2.5Y 6/2) clay loam, light gray (2.5Y 7/2) dry; weak medium prismatic structure parting to moderate fine and medium granular; hard, very friable, moderately sticky and moderately plastic; common fine and few medium roots; common fine pores; few fine masses of lime; violently effervescent; moderately alkaline (pH 8.4); clear smooth boundary.
- Bk2—15 to 25 inches; brown (10YR 5/3) clay loam, very pale brown (10YR 7/3) dry, common fine distinct yellowish brown (10YR 5/6) redox concentrations; weak medium prismatic structure parting to moderate medium granular; very hard, friable, moderately sticky and moderately plastic; few very fine and fine roots; common very fine pores; common fine masses of lime; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary.
- Bk3—25 to 48 inches; brown (10YR 4/3) clay loam, pale brown (10YR 6/3) dry, many medium distinct yellowish brown (10YR 5/6) redox concentrations and few fine gray (10YR 5/1) redox depletions; massive; very hard, friable, moderately sticky and moderately plastic; few very fine roots; common very fine pores; 10 percent gravel; few fine masses of lime; strongly effervescent; moderately alkaline (pH 8.2); clear wavy boundary.
- C—48 to 60 inches; brown (10YR 4/3) gravelly clay loam, pale brown (10YR 6/3) dry, many medium distinct yellowish brown (10YR 5/6) redox concentrations and common fine gray (10YR 5/1) redox depletions; massive; very hard, friable, moderately sticky and moderately plastic; 25 percent gravel; disseminated lime; strongly effervescent; moderately alkaline (pH 8.2).

## ***Scravo Series***

**Taxonomic Class:** Sandy-skeletal, mixed, frigid Aridic Calciustepts

### **Typical Pedon**

Scravo gravelly loam (Colors are for dry soil unless otherwise noted.)

- Ap—0 to 6 inches; light brownish gray (10YR 6/2) gravelly loam, dark grayish brown (10YR 4/2) moist; moderate fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; 20 percent gravel; disseminated lime; continuous prominent lime casts on undersides of gravel; strongly effervescent; slightly alkaline (pH 7.6); clear smooth boundary.
- Bk—6 to 17 inches; light gray (10YR 7/2) extremely gravelly sandy loam, grayish brown (10YR 5/2) moist; weak fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; common very fine roots; 65 percent gravel; many fine masses of lime; disseminated lime; continuous prominent lime casts on undersides of gravel; violently effervescent; moderately alkaline (pH 8.0); clear wavy boundary.
- 2Bk—17 to 60 inches; light brownish gray (10YR 6/2) extremely gravelly loamy sand, dark grayish brown (10YR 4/2) moist; single grain; loose, nonsticky and nonplastic;

few very fine roots; 65 percent gravel; disseminated lime; common prominent lime and silica casts on undersides of gravel; strongly effervescent; moderately alkaline.

## ***Sebud Series***

**Taxonomic Class:** Loamy-skeletal, mixed, superactive Ustic Haplocryolls

### **Typical Pedon**

Sebud loam, very stony (Colors are for dry soil unless otherwise noted.)

- A1—0 to 4 inches; very dark grayish brown (10YR 3/2) loam, very dark brown (10YR 2/2) moist; weak granular structure parting to fine crumb structure; soft, friable, nonsticky and nonplastic; many very fine and fine roots; occasional boulder; 3 percent stone surface cover; 10 percent gravel; neutral (pH 7.2); clear smooth boundary.
- A2—4 to 10 inches; dark grayish brown (10YR 4/2) very stony clay loam, very dark grayish brown (10YR 3/2) moist; very dark brown (10YR 2/2) moist coats; moderate fine and medium blocky structure; slightly hard, friable, moderately sticky and moderately plastic; many very fine roots and pores; 1 percent boulders, 40 percent stones, 10 percent gravel; slightly alkaline (pH 7.5); clear wavy boundary.
- Bw1—10 to 22 inches; yellowish brown (10YR 5/4) very stony clay loam, dark brown (10YR 3/3) moist; dark yellowish brown (10YR 3/4) moist coats; moderate fine and medium subangular blocky structure; slightly hard, friable, moderately sticky and moderately plastic; few very fine roots and pores; 1 percent boulders, 40 percent stones, 10 percent cobbles and gravel; slightly alkaline (pH 7.4); clear wavy boundary.
- Bw2—22 to 28 inches; light yellowish brown (10YR 6/4) very stony coarse sandy clay loam, yellowish brown (10YR 5/4) moist; moderate medium subangular blocky structure; slightly hard, friable, moderately sticky and slightly plastic; few very fine roots and pores; 1 percent boulders, 40 percent stones, 5 percent gravel; slightly alkaline (pH 7.6); gradual wavy boundary.
- Bw3—28 to 49 inches; very pale brown (10YR 7/3) very stony coarse sandy clay loam, yellowish brown (10YR 5/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and moderately plastic; few very fine roots; 1 percent boulders, 40 percent stones, 5 percent weathered granitic gravel; many clear quartz sand grains; slightly alkaline (pH 7.8); gradual wavy boundary.
- Bw4—49 to 62 inches; very pale brown (10YR 7/3) very stony clay loam, yellowish brown (10YR 5/4) moist; moderate coarse subangular blocky structure; hard, firm, moderately sticky and moderately plastic; few very fine tubular pores; 1 percent boulders, 40 percent stones, 5 percent gravel; slightly alkaline (pH 7.8).

## ***Shewag Taxadjunct***

**Taxonomic Class:** Sandy, mixed Oxyaquic Haplocryolls

### **Typical Pedon**

Shewag sandy loam (Colors are for dry soil unless otherwise noted.)

- Oe—0 to 2 inches; moderately decomposed roots; clear smooth boundary.
- A—2 to 8 inches; dark gray (10YR 4/1) sandy loam, black (10YR 2/1) moist; weak very fine and fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and few fine roots; many very fine and fine dendritic pores; 5 percent gravel; slightly acid (pH 6.2); clear wavy boundary.

- Bw—8 to 14 inches; grayish brown (10YR 5/2) coarse sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; many very fine and few fine roots; many very fine and common fine dendritic pores; 10 percent gravel; slightly acid (pH 6.4); clear wavy boundary.
- 2C—14 to 60 inches; light brownish gray (10YR 6/2) gravelly loamy coarse sand, grayish brown (10YR 5/2) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; common fine interstitial pores; 30 percent gravel; neutral (pH 6.6).

## ***Sieben Series***

**Taxonomic Class:** Loamy-skeletal, mixed, superactive, frigid Calcic Argiustolls

### **Typical Pedon**

Sieben gravelly loam (Colors are for dry soil unless otherwise noted.)

- A1—0 to 5 inches; grayish brown (10YR 5/2) gravelly loam, very grayish brown (10YR 3/2) moist; moderate very thin platy structure parting to moderate very fine granular; slightly hard, very friable, slightly sticky and slightly plastic; many very fine roots; 20 percent angular gravel; slightly acid (pH 6.2); clear smooth boundary.
- A2—5 to 9 inches; grayish brown (10YR 5/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, very friable, slightly sticky and slightly plastic; many very fine roots; many very fine tubular and interstitial pores; 20 percent angular gravel; slightly acid (pH 6.2); clear smooth boundary.
- Bt1—9 to 17 inches; pale brown (10YR 6/3) very gravelly clay loam, dark brown (10YR 4/3) moist; moderate prismatic structure parting to moderate fine and medium subangular blocky; hard, friable, moderately sticky and moderately plastic; common very fine roots; many very fine tubular and interstitial pores; many distinct brown (10YR 5/3) clay films on faces of peds; 45 percent angular gravel; slightly acid (pH 6.4); gradual smooth boundary.
- Bt2—17 to 21 inches; pale brown (10YR 6/3) extremely gravelly loam, dark brown (10YR 4/3) moist; weak fine subangular blocky structure; slightly hard, very friable, moderately sticky and slightly plastic; common very fine roots; many very fine tubular and interstitial pores; few faint clay films on faces of peds and on coarse fragments; 5 percent angular cobbles, 55 percent angular gravel; few faint lime casts on undersides of coarse fragments; slightly alkaline (pH 7.8); gradual smooth boundary.
- Bk1—21 to 30 inches; very pale brown (10YR 7/3) very gravelly loam, pale brown (10YR 6/3) moist; weak fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; many very fine tubular and interstitial pores; 10 percent angular cobbles, 45 percent angular gravel; continuous distinct lime casts on undersides of rock fragments; many fine seams and masses of lime; violently effervescent; moderately alkaline (pH 8.0); gradual smooth boundary.
- Bk2—30 to 41 inches; very pale brown (10YR 7/3) extremely gravelly loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; 20 percent angular cobbles, 55 percent angular gravel; continuous lime prominent on rock fragments; lime-cemented sand and fine gravel on undersides of some rock fragments; violently effervescent; moderately alkaline (pH 8.0); gradual smooth boundary.
- Bk3—41 to 60 inches; pale brown (10YR 6/3) extremely gravelly sandy loam, dark brown (10YR 4/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; 15 percent angular cobbles, 60 percent angular gravel; continuous

faint lime casts on undersides of rock fragments; strongly effervescent; moderately alkaline (pH 8.0).

### ***Sigbird Series***

**Taxonomic Class:** Loamy-skeletal, mixed, superactive Lithic Eutrocryepts

#### **Typical Pedon**

Sigbird very channery loam, very bouldery (Colors are for dry soil unless otherwise noted.)

A—0 to 5 inches; brown (10YR 5/3) extremely channery loam, dark brown (10YR 3/3) moist; moderate medium granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine interstitial pores; 10 percent flagstones, 50 percent channers; neutral (pH 7.2); clear wavy boundary.

Bw—5 to 14 inches; pale brown (10YR 6/3) extremely channery loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; common very fine and fine roots; common very fine and fine interstitial and tubular pores; 15 percent flagstones, 60 percent channers; slightly alkaline (pH 7.4); clear smooth boundary.

R—14 to 60 inches; fractured hard shale.

### ***Silas Series***

**Taxonomic Class:** Fine-loamy, mixed, superactive Cumulic Haplocryolls

#### **Typical Pedon**

Silas loam (Colors are for dry soil unless otherwise noted.)

A1—0 to 3 inches; very dark gray (10YR 3/1) loam, black (10YR 2/1) moist; weak very fine crumb structure; soft, very friable, slightly sticky and nonplastic; many very fine, medium, and coarse roots; few cobbles and gravel; neutral (pH 6.8); abrupt smooth boundary.

A2—3 to 22 inches; very dark grayish brown (10YR 3/2) loam, very dark brown (10YR 2/2) moist with thin lenses of black (10YR 2/1) and very dark gray (10YR 3/1); massive; soft, very friable, slightly sticky and nonplastic; many very fine and medium coarse roots; few cobbles and gravel; neutral (pH 6.9); abrupt wavy boundary.

C—22 to 60 inches; brown (10YR 5/3) gravelly loam stratified with thin lenses of very fine sandy loam, silt loam, brown (10YR 4/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; 5 percent cobbles, 10 percent gravel; neutral (pH 7.0).

### ***Sixbeacon Series***

**Taxonomic Class:** Loamy-skeletal, mixed, superactive, frigid Aridic Haplustolls

#### **Typical Pedon**

Sixbeacon gravelly loam (Colors are for dry soil unless otherwise noted.)

Ap—0 to 4 inches; grayish brown (10YR 5/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; many fine irregular pores; 15 percent gravel; neutral (pH 6.8); abrupt smooth boundary.

Bw—4 to 10 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; many fine roots; many very fine and fine tubular pores; 5 percent gravel; neutral (pH 7.2); clear wavy boundary.

Bk1—10 to 12 inches; light brownish gray (10YR 6/2) loam, brown (10YR 5/3) moist; weak fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine roots; many very fine and fine pores; 10 percent gravel; disseminated lime; strongly effervescent; moderately alkaline (pH 8.0); clear wavy boundary.

2Bk2—12 to 24 inches; very pale brown (10YR 8/2) very gravelly sandy loam, light gray (10YR 7/2) moist; weak fine subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common fine roots; many very fine and fine tubular pores; 50 percent gravel; disseminated lime; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary.

3Bk3—24 to 60 inches; light gray (10YR 7/2) extremely gravelly loamy sand, pale brown (10YR 6/3) moist; single grain; loose, nonsticky and nonplastic; few fine roots; many fine irregular pores; 10 percent cobbles, 60 percent gravel; disseminated lime; violently effervescent; moderately alkaline (pH 8.4).

## ***Skaggs Series***

**Taxonomic Class:** Loamy-skeletal, carbonatic Calcic Haplocryolls

### **Typical Pedon**

Skaggs loam (Colors are for dry soil unless otherwise noted.)

A1—0 to 4 inches, very dark gray (10YR 3/1) loam, black (10YR 2/1) moist; strong very fine granular structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots; few limestone fragments; neutral; clear wavy boundary.

A2—4 to 10 inches, very dark gray (10YR 3/1) loam, black (10YR 2/1) moist; weak medium blocky structure parting to moderate fine granular; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine pores; 10 percent limestone fragments; slightly effervescent; slightly alkaline; clear wavy boundary.

Bk1—10 to 21 inches, light brownish gray (10YR 6/2) gravelly clay loam, dark grayish brown (10YR 4/2) moist; strong very fine subangular blocky structure; slightly hard, friable, moderately sticky and moderately plastic; common very fine and fine roots; many very fine and fine pores; 10 percent limestone cobbles, 30 percent limestone gravel; strongly effervescent; moderately alkaline; clear wavy boundary.

Bk2—21 to 32 inches, light gray (2.5Y 7/2) very stony clay loam, grayish brown (2.5Y 5/2) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, moderately sticky and moderately plastic; few very fine and fine roots; many very fine and fine pores; 20 percent stones, 25 percent gravel; strongly effervescent; moderately alkaline; gradual wavy boundary.

R—32 to 60 inches; interbedded limestone and shale; strongly effervescent; moderately alkaline.

## ***Spudbar Series***

**Taxonomic Class:** Loamy-skeletal, mixed, superactive, frigid Aridic Calciustolls

### **Typical Pedon**

Spudbar very cobbly loam (Colors are for dry soil unless otherwise noted.)



- A—0 to 6 inches; brown (10YR 5/3) very cobbly loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure parting to weak fine granular; soft, very friable, slightly sticky and slightly plastic; many very fine, common fine, and few medium roots; many very fine interstitial pores; 20 percent cobbles, 20 percent gravel; disseminated lime; slightly effervescent; slightly alkaline (pH 7.6); clear smooth boundary.
- Bk1—6 to 18 inches; very pale brown (10YR 8/3) very gravelly loam, pale brown (10YR 6/3) moist; weak fine subangular blocky structure parting to weak fine granular; soft, very friable, slightly sticky and slightly plastic; common very fine and few fine roots; common fine interstitial pores; 15 percent cobbles, 40 percent gravel; many distinct carbonate coats on rock fragments; common irregular fine masses of lime; violently effervescent; moderately alkaline (pH 8.2); clear smooth boundary.
- Bk2—18 to 22 inches; very pale brown (10YR 8/2) extremely gravelly sandy loam, pale brown (10YR 6/3) moist; weak fine granular structure; soft, very friable, slightly sticky and nonplastic; few very fine roots; few very fine interstitial pores; 15 percent cobbles, 60 percent gravel; many distinct carbonate coats on rock fragments; common irregular masses of lime; violently effervescent; moderately alkaline (pH 8.4); clear smooth boundary.
- R—22 to 60 inches; slightly weathered igneous rock.

### ***Starley Series***

**Taxonomic Class:** Loamy-skeletal, mixed, superactive Lithic Haplocryolls

#### **Typical Pedon**

Starley very cobbly loam (Colors are for dry soil unless otherwise noted.)

- A—0 to 9 inches; brown (10YR 5/3) very cobbly loam, dark brown (10YR 3/3) moist; strong fine granular structure; soft, very friable, moderately sticky and slightly plastic; 40 percent angular limestone fragments 3 to 10 inches in diameter; neutral (pH 6.8); gradual wavy boundary.
- Bk—9 to 15 inches; pale brown (10YR 6/3) extremely cobbly loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, moderately sticky and slightly plastic; strongly effervescent; calcium carbonate disseminated and as inconsistent common soft masses and as thin pendants on some rock fragments; 65 percent angular limestone fragments mainly 3 to 10 inches in diameter; moderately alkaline (pH 8.0); abrupt wavy boundary.
- R—15 to 60 inches; hard limestone.

### ***Stecum Series***

**Taxonomic Class:** Sandy-skeletal, mixed Typic Cryorthents

#### **Typical Pedon**

Stecum coarse sandy loam (Colors are for dry soil unless otherwise noted.)

- A1—0 to 5 inches; light brownish gray (10YR 6/2) coarse sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure parting to weak coarse granular; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine roots; common fine pores; 10 percent gravel; neutral (pH 7.3); clear smooth boundary.
- A2—5 to 12 inches; pale brown (10YR 6/3) gravelly loamy coarse sand, brown (10YR 4/3) moist; weak fine subangular blocky structure parting to weak coarse granular;

- slightly hard, very friable, nonsticky and nonplastic; few fine roots; few fine pores; 5 percent cobbles, 10 percent gravel; neutral (pH 7.3); clear wavy boundary.
- C—12 to 28 inches; light gray (2.5Y 7/2) very gravelly coarse sand, pale brown (10YR 6/3) moist; massive; loose, nonsticky and nonplastic; few fine roots; 5 percent stones, 5 percent cobbles, 35 percent gravel; neutral (pH 7.3); abrupt smooth boundary.
- Cr—28 to 60 inches; fractured and partly weathered micaceous granite and gneiss.

## ***Surdal Series***

**Taxonomic Class:** Loamy-skeletal, mixed, superactive Ustic Haplocryolls

### **Typical Pedon**

Surdal cobbly loam, stony (Colors are for dry soil unless otherwise noted.)

- A1—0 to 7 inches; dark grayish brown (10YR 4/2) cobbly loam, very dark brown (10YR 2/2) moist; moderate fine and medium granular structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots; many very fine and fine interstitial pores; 10 percent cobbles, 10 percent gravel; slightly acid (pH 6.2); clear wavy boundary.
- A2—7 to 13 inches; dark grayish brown (10YR 4/2) very cobbly loam, very dark grayish brown (10YR 3/2) moist; weak medium prismatic structure parting to moderate medium subangular blocky; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots; many very fine and fine interstitial pores; 15 percent cobbles, 25 percent gravel; slightly acid (pH 6.2); clear wavy boundary.
- Bw1—13 to 23 inches; grayish brown (10YR 5/2) very cobbly loam, brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots; many very fine and fine interstitial pores; 15 percent cobbles, 30 percent gravel; slightly acid (pH 6.4); gradual wavy boundary.
- Bw2—23 to 31 inches; brown (10YR 5/3) extremely cobbly loam, brown (10YR 4/3) moist; weak coarse subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine and few medium roots; common very fine and fine interstitial pores; 30 percent cobbles, 30 percent gravel; slightly acid (pH 6.4); clear wavy boundary.
- R—31 to 60 inches; hard, slightly fractured, fine-grained igneous bedrock.

## ***Tepete Series***

**Taxonomic Class:** Loamy, mixed, euic Terric Cryohemists

### **Typical Pedon**

Tepete mucky peat (Colors are for moist soil unless otherwise noted.)

- Oe1—0 to 7 inches; very dark brown (10YR 2/2), broken face mucky peat; about 40 percent fiber and 35 percent rubbed; many very fine and fine and common medium roots; massive; fibers are primarily brown (10YR 4/3) and very dark brown (10YR 2/2) dry sedges and rushes; moderately acid (pH 5.6); clear smooth boundary.
- Oe2—7 to 14 inches; black (10YR 2/1) broken face mucky peat; about 40 percent fiber and 35 percent rubbed; many very fine and common fine and medium roots; massive; fibers are primarily sedges and rushes; moderately acid (pH 5.6); clear smooth boundary.
- Oe3—14 to 25 inches; black (10YR 2/1) broken face mucky peat, black (10YR 2/1) dry; about 75 percent fiber and 60 percent rubbed; fibrous or massive; extremely

- hard and wets very slowly; very friable; few very fine and fine roots; fibers are primarily sedges and rushes; neutral (pH 6.8); clear smooth boundary.
- Oe4—25 to 29 inches; black (10YR 2/1) broken face mucky peat, black (10YR 2/1) dry; few thin layers of very dark gray (N 3/) silty clay loam, dark gray (N 4/) dry; about 75 percent fiber and 60 percent rubbed; massive; extremely hard, very friable, slightly sticky and slightly plastic; fibers are primarily sedges and rushes; neutral (pH 6.8); clear smooth boundary.
- A—29 to 34 inches; black (N 2/) silty clay loam, dark gray (2.5Y 4/1) dry; massive; extremely hard, firm, moderately sticky and moderately plastic; common very fine tubular pores; contains common partially decomposed plant remains; neutral (pH 6.8); clear smooth boundary.
- Cg1—34 to 43 inches; dark gray (5Y 4/1) silty clay loam, gray (5Y 6/1) dry; massive; very hard, friable, moderately sticky and moderately plastic; few very fine tubular pores; common fine prominent black (10YR 2/1) and few fine distinct very dark grayish brown (10YR 3/2) irregularly shaped iron masses around roots and on surfaces along pores; the lower 3 to 6 inches of this horizon contains pockets of very fine sand and silt having common coarse prominent yellowish brown (10YR 5/6) irregularly shaped iron masses, brownish yellow (10YR 6/6) dry; contains common partially decomposed plant remains; slightly alkaline (pH 7.6); clear wavy boundary.
- 2Cg2—43 to 58 inches; grayish brown (2.5Y 5/2) gravelly loamy sand, light brownish gray (2.5Y 6/2) dry; single grain; loose, nonsticky and nonplastic; 30 percent gravel, dominantly granite and some sandstone, quartzite, and limestone; moderately alkaline (pH 8.0).
- 2Cg3—58 to 60 inches; very gravelly sand; single grain; loose, nonsticky and nonplastic; 50 percent gravel; moderately alkaline (pH 8.0).

## ***Tepete Taxadjunct***

**Taxonomic Class:** Sandy, mixed, euic Terric Cryohemists

### **Typical Pedon**

Tepete mucky peat (Colors are for moist soil unless otherwise noted.)

- Oi—0 to 7 inches; very dark brown (10YR 2/2), mucky peat; about 55 percent fiber and 45 percent rubbed; many very fine and fine and common medium roots; slightly acid (pH 6.5); clear smooth boundary.
- Oe—7 to 18 inches; black (10YR 2/1) mucky peat; about 40 percent fiber and 35 percent rubbed; many very fine and common fine and medium roots; slightly acid (pH 6.5); clear smooth boundary.
- AC—18 to 24 inches; black (10YR 2/1) gravelly fine sandy loam, dark gray (10YR 4/1) dry; massive; hard, firm, nonsticky and nonplastic; few fine roots; contains common partially decomposed plant remains; common very fine tubular pores; 25 percent gravel; neutral (pH 6.8); clear smooth boundary.
- O'e—24 to 29 inches; black (10YR 2/1) mucky peat; about 40 percent fiber and 35 percent rubbed; few very fine roots; slightly acid (pH 6.5); clear smooth boundary.
- Cg—29 to 54 inches; grayish brown (2.5Y 5/2) gravelly coarse sand, light brownish gray (2.5Y 6/2) dry; single grain; loose, nonsticky and nonplastic; common fine interstitial pores; 30 percent gravel; neutral (pH 6.8); clear wavy boundary.
- 2Cg—54 to 66 inches; dark gray (5Y 4/1) loam, gray (5Y 6/1) dry; massive; hard, firm, slightly sticky and slightly plastic; common fine prominent black (10YR 2/1) and few fine distinct very dark grayish brown (10YR 3/2) irregularly shaped iron masses along pores; few very fine tubular pores; contains common partially decomposed plant remains; neutral (pH 6.8); clear wavy boundary.

3Cg—66 to 72 inches; grayish brown (2.5Y 5/2) gravelly coarse sand, light brownish gray (2.5Y 6/2) dry; single grain; loose; nonsticky and nonplastic; common fine interstitial pores; 30 percent gravel; neutral (pH 6.8).

## ***Tiban Series***

**Taxonomic Class:** Loamy-skeletal, mixed, superactive Ustic Haplocryolls

### **Typical Pedon**

Tiban stony clay loam (Colors are for dry soil unless otherwise noted.)

- A—0 to 4 inches; brown (7.5YR 4/2) very stony clay loam, dark brown (10YR 3/3) moist; very dark grayish brown (10YR 3/2) moist coats; weak medium subangular blocky structure parting to fine granular; slightly hard, friable, nonsticky and nonplastic; many very fine roots and pores; 35 percent subangular stones, cobbles, and gravel; neutral; clear smooth boundary.
- Bw—4 to 13 inches; grayish brown (10YR 5/2) very gravelly clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; slightly hard, friable, moderately sticky and slightly plastic; many very fine roots and pores; 35 percent cobbles and gravel; many clear silt and fine sand grains; slightly alkaline; clear wavy boundary.
- Bk—13 to 23 inches; brown (10YR 5/3) very gravelly clay loam, brown (10YR 4/3) moist; brown (10YR 4/3) moist coats; weak medium subangular blocky structure; slightly hard, friable, moderately sticky and slightly plastic; few very fine roots and pores; roots matted around rocks; 45 percent gravel; common distinct lime coats with incrustation on undersides of gravel; common fine masses of lime; strongly effervescent; moderately alkaline; clear wavy boundary.
- C—23 to 60 inches; light reddish brown (2.5YR 6/4) very gravelly clay loam, red (2.5YR 4/6) moist; massive; slightly hard, friable, moderately sticky and moderately plastic; few very fine roots and pores; 50 percent stones, cobbles, and gravel of limestone, quartzite, and sandstone; rock fragments are all subangular and lime coated on the undersides; strongly effervescent; moderately alkaline.

## ***Tibson Series***

**Taxonomic Class:** Loamy-skeletal, mixed, superactive Calcic Haplocryolls

### **Typical Pedon**

Tibson cobbly loam (Colors are for dry soil unless otherwise noted.)

- A—0 to 4 inches; very dark grayish brown (10YR 3/2) cobbly loam, black (10YR 2/1) moist; moderate fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine and common medium roots; common very fine irregular pores; 10 percent cobbles, 10 percent gravel; slightly alkaline (pH 7.6); clear wavy boundary.
- Bw—4 to 8 inches; dark brown (10YR 3/3) cobbly loam, very dark brown (10YR 2/2) moist; moderate fine prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; common very fine irregular pores; 10 percent cobbles, 10 percent gravel; slightly effervescent; slightly alkaline (pH 7.8); gradual wavy boundary.
- Bk1—8 to 14 inches; pale brown (10YR 6/3) very cobbly clay loam, brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, firm, slightly sticky and moderately plastic; common very fine and fine roots; common fine tubular pores with lime coats and masses

filling pores; many medium masses of lime; 15 percent cobbles, 20 percent gravel; violently effervescent; moderately alkaline (pH 8.0); gradual wavy boundary.  
Bk2—14 to 60 inches; pale brown (10YR 6/3) very cobbly clay loam, brown (10YR 5/3) moist; weak coarse prismatic structure; very hard, firm, slightly sticky and moderately plastic; common very fine roots to 42 inches and few very fine roots below this depth; common medium masses of lime; 20 percent cobbles, 30 percent gravel; violently effervescent; moderately alkaline (pH 8.2).

## ***Tigeron Series***

**Taxonomic Class:** Loamy-skeletal, mixed, superactive Eutric Haplocryalfs

### **Typical Pedon**

Tigeron flaggy sandy loam (Colors are for dry soil unless otherwise noted.)

- O—1 inch to 0; forest litter of undecomposed and decomposed needles, twigs, and cones.
- E1—0 to 3 inches; light brownish gray (10YR 6/2) flaggy sandy loam, very dark grayish brown (10YR 3/2) moist; strong thin platy structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; continuous coats of sand grains on surface of plates; 10 percent flagstones, 5 percent channers; strongly acid (pH 5.4); clear wavy boundary.
- E2—3 to 7 inches; light gray (10YR 7/2) flaggy sandy loam, dark grayish brown (10YR 4/2) moist; moderate thin platy structure; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine roots; continuous coats of sand grains on plates; 20 percent flagstones, 10 percent channers; strongly acid (pH 5.4); clear wavy boundary.
- E and Bt—7 to 13 inches; E part (75 percent) light gray (10YR 7/2) flaggy sandy loam, grayish brown (10YR 5/2) moist; Bt part (25 percent) pale brown (10YR 6/3) sandy clay loam, brown (10YR 4/3) moist; 1/16- to 3/8-inch thick lamellae; moderate fine subangular blocky structure; hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine and few medium pores in the E horizon and lamellae; thin clay films in root channels; 20 percent flagstones, 10 percent channers; strongly acid (pH 5.4); clear wavy boundary.
- Bt and E—13 to 24 inches; Bt part (60 percent) pale brown (10YR 6/3) very flaggy sandy clay loam, brown (10YR 4/3) moist; 1/16- to 1/2-inch thick lamellae; E part (40 percent) light gray (10YR 7/2) sandy loam, dark grayish brown (10YR 4/2) moist; strong very fine and fine blocky structure; very hard, friable, moderately sticky and moderately plastic; common very fine and fine roots; many very fine and fine and few medium pores; continuous faint clay films on faces of peds and on undersides of rock fragments and in root channels; 30 percent flagstones, 15 percent channers; strongly acid (pH 5.4); gradual wavy boundary.
- Bt—24 to 61 inches; pale brown (10YR 6/3) extremely flaggy sandy clay loam, brown (10YR 4/3) moist; strong fine and medium blocky structure; extremely hard, friable, moderately sticky and moderately plastic; few very fine and fine roots; many very fine and fine and few medium pores; continuous prominent clay films on all faces of peds and in root channels; continuous prominent clay films on all surfaces of smaller rock fragments and on undersides of larger rock fragments; common faint coats of sand grains on faces of peds and on surface of rock fragments; 30 percent flagstones, 30 percent channers; strongly acid (pH 5.4); gradual wavy boundary.
- 2C—61 to 67 inches; gray (10YR 6/1) very flaggy loam, dark gray (10YR 4/1) moist; massive; extremely hard, friable, moderately sticky and moderately plastic; few very fine and fine roots; common very fine and fine pores; 30 percent flagstones, 20 percent channers.

## ***Travona Series***

**Taxonomic Class:** Ashy, glassy, frigid Vitrandic Haplustolls

### **Typical Pedon**

Travona ashy loam (Colors are for dry soil unless otherwise noted.)

- A—0 to 9 inches; grayish brown (10YR 5/2) ashy loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; slightly hard, friable, slightly sticky and slightly plastic; many fine and medium roots; common fine and few medium tubular pores; 10 percent gravel; neutral (pH 6.6); clear wavy boundary.
- Bw—9 to 23 inches; grayish brown (10YR 5/2) ashy loam, dark grayish brown (10YR 4/2) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many fine and medium roots; common fine and few medium tubular pores; 10 percent gravel; neutral (pH 7.0); clear wavy boundary.
- Bk—23 to 41 inches; very pale brown (10YR 8/2) ashy loam, pale brown (10YR 6/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and slightly plastic; common fine and few medium roots; common fine tubular pores; 10 percent gravel; common fine masses of lime; violently effervescent; moderately alkaline (pH 8.2); gradual wavy boundary.
- BK—41 to 60 inches; very pale brown (10YR 8/2) ashy sandy loam, pale brown (10YR 6/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and slightly plastic; few very fine and fine roots; common very fine and fine tubular pores; disseminated lime; few fine masses of lime; violently effervescent; moderately alkaline (pH 8.2); gradual wavy boundary.

## ***Trimad Series***

**Taxonomic Class:** Loamy-skeletal, mixed, superactive, frigid Aridic Calcicustolls

### **Typical Pedon**

Trimad cobbly loam (Colors are for dry soil unless otherwise noted.)

- A—0 to 2 inches; dark grayish brown (10YR 4/2) cobbly loam, very dark grayish brown (10YR 3/2) moist; moderate very fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine irregular pores; 10 percent cobbles, 10 percent gravel; neutral (pH 7.1); clear smooth boundary.
- Bw—2 to 6 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; moderate medium prismatic structure parting to fine strong subangular blocky; hard, friable, moderately sticky and moderately plastic; many fine roots; many very fine irregular and tubular pores; 10 percent cobbles, 15 percent gravel; neutral (pH 7.2); clear smooth boundary.
- Bk1—6 to 9 inches; light gray (10YR 7/2) gravelly loam, grayish brown (10YR 5/2) moist; weak medium prismatic structure parting to moderate fine subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common fine roots; common very fine irregular and tubular pores; 5 percent cobbles, 15 percent gravel; lime coats on cobbles and gravel; disseminated lime; strongly effervescent; slightly alkaline (pH 7.7); clear smooth boundary.
- Bk2—9 to 18 inches; light gray (10YR 7/2) very gravelly loam, light brownish gray (10YR 6/2) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine roots; common fine vesicular pores and few very fine tubular pores; 10 percent cobbles, 30 percent gravel; lime coats on cobbles and gravel;

disseminated lime; violently effervescent; moderately alkaline (pH 8.0); clear wavy boundary.

Bk3—18 to 60 inches; light brownish gray (10YR 6/2) extremely gravelly sandy loam, grayish brown (10YR 5/2) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine roots; many fine irregular pores; 20 percent cobbles, 50 percent gravel; lime coats on cobbles and gravel; disseminated lime; strongly effervescent; slightly alkaline (pH 7.6).

## ***Tropal Series***

**Taxonomic Class:** Loamy-skeletal, carbonatic Lithic Eutrocryepts

### **Typical Pedon**

Tropal gravelly loam, bouldery (Colors are for dry soil unless otherwise noted.)

Oi—0.5 to 0 inches; partially decomposed needles, twigs, and leaves.

A—0 to 4 inches; brown (10YR 5/3) very gravelly loam, dark grayish brown (10YR 4/2) moist; moderate medium granular structure; slightly hard, very friable, nonsticky and nonplastic; many fine roots; common very fine and fine pores; 5 percent cobbles, 40 percent gravel; continuous distinct lime coats on undersides of rock fragments; violently effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary.

Bk—4 to 16 inches; light gray (10YR 7/2) very gravelly loam, grayish brown (10YR 5/2) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine roots; common very fine and fine pores; 10 percent cobbles, 50 percent gravel; continuous prominent lime casts on rock fragments; disseminated lime; violently effervescent; moderately alkaline (pH 8.4); gradual wavy boundary.

R—16 to 60 inches; hard limestone.

## ***Tuggle Series***

**Taxonomic Class:** Loamy, mixed, superactive Lithic Haplocryolls

### **Typical Pedon**

Tuggle gravelly coarse sandy loam, very bouldery (Colors are for dry soil unless otherwise noted.)

A—0 to 7 inches; dark brown (10YR 3/3) gravelly coarse sandy loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine and common medium roots; many very fine and fine and few medium pores; 20 percent gravel; neutral (pH 7.2); clear wavy boundary.

Bw—7 to 11 inches; brown (10YR 4/3) gravelly coarse sandy loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine and common medium roots; many very fine and few fine tubular and interstitial pores; 20 percent gravel; neutral (pH 7.3); clear wavy boundary.

BC—11 to 15 inches; brown (10YR 5/3) gravelly coarse sandy loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine, common fine, and few medium roots; many very fine and few fine tubular and interstitial pores; 25 percent gravel; neutral (pH 7.3); gradual wavy boundary.

Cr—15 to 18 inches; light brownish gray (10YR 6/2) decomposed granite bedrock (grus) that crushes to very gravelly loamy coarse sand.

R—18 to 60 inches; hard granite bedrock.

## ***Udecide Series***

**Taxonomic Class:** Fine-loamy, mixed, superactive, frigid Aridic Argiustolls

### **Typical Pedon**

Udecide sandy clay loam (Colors are for dry soil unless otherwise noted.)

A—0 to 5 inches; grayish brown (10YR 5/2) sandy clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots; many very fine and fine interstitial and tubular pores; 5 percent gravel; neutral (pH 7.0); clear wavy boundary.

Bt1—5 to 9 inches; dark grayish brown (10YR 4/2) sandy clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine interstitial and tubular pores; common distinct dark brown (10YR 3/3) clay films on faces of peds and bridging sand grains; 5 percent gravel; neutral (pH 7.2); clear wavy boundary.

Bt2—9 to 14 inches; grayish brown (10YR 5/2) loam, dark grayish brown (10YR 4/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine interstitial and tubular pores; common distinct dark brown (10YR 3/3) clay films on faces of peds and bridging sand grains; 5 percent gravel; neutral (pH 7.2); gradual wavy boundary.

Bk1—14 to 20 inches; light brownish gray (10YR 6/2) gravelly loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine interstitial and tubular pores; 15 percent gravel; disseminated lime; common fine masses and threads of lime; few faint light gray (10YR 7/1) lime coats on undersides of gravel; strongly effervescent; moderately alkaline (pH 8.2); gradual wavy boundary.

Bk2—20 to 28 inches; light brownish gray (10YR 6/2) gravelly sandy clay loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; common very fine and fine roots; common very fine and fine interstitial and tubular pores; 15 percent gravel; disseminated lime; common medium masses and threads of lime; common distinct lime coats on undersides of gravel; violently effervescent; slightly alkaline (pH 7.8); clear smooth boundary.

Cr—28 to 60 inches; light brownish gray (2.5Y 6/2) weakly consolidated sandstone that crushes to loamy sand.

## ***Valleyflat Series***

**Taxonomic Class:** Sandy, mixed, frigid Aridic Haplustolls

### **Typical Pedon**

Valleyflat coarse sandy loam (Colors are for dry soil unless otherwise noted.)

A1—0 to 2 inches; brown (10YR 5/3) coarse sandy loam, very dark grayish brown (10YR 3/2) moist; weak very thin platy structure; soft, very friable, slightly sticky



and slightly plastic; common very fine and few fine roots; 5 percent, mainly fine, gravel; strongly acid (pH 5.2); clear smooth boundary.

A2—2 to 5 inches; brown (10YR 5/3) sandy loam, very dark grayish brown (10YR 3/2) moist; weak very thin platy structure; soft, very friable, slightly sticky and slightly plastic; common fine and many very fine roots; 5 percent, mainly fine, gravel; slightly acid (pH 6.2); clear smooth boundary.

Bw—5 to 11 inches; yellowish brown (10YR 5/4) sandy loam, dark yellowish brown (10YR 3/4) moist; moderate medium or coarse subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and few fine roots; few faint clay bridges between sand grains; 10 percent, mainly fine, gravel; neutral (pH 6.8); clear wavy boundary.

2C1—11 to 40 inches; variegated very pale brown (10YR 8/2) and very pale brown (10YR 7/3) gravelly coarse sand with thin strata of very gravelly coarse sand, light yellowish brown (10YR 6/4) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; 30 percent, mainly fine, gravel; neutral (pH 7.2); diffuse smooth boundary.

2C2—40 to 72 inches; variegated very pale brown (10YR 8/2) and very pale brown (10YR 7/3) gravelly coarse sand with thin strata of very gravelly coarse sand, light yellowish brown (10YR 6/4) moist; single grain; loose, nonsticky and nonplastic; 35 percent, mainly fine, gravel; neutral (pH 7.2); diffuse smooth boundary.

### ***Valleyflat Taxadjunct***

**Taxonomic Class:** Sandy, mixed, frigid Aridic Haplustepts

#### **Typical Pedon**

Valleyflat coarse sandy loam (Colors are for dry soil unless otherwise noted.)

A1—0 to 2 inches; brown (10YR 5/3) coarse sandy loam, very dark grayish brown (10YR 3/2) moist; weak very thin platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common fine interstitial pores; 5 percent gravel; slightly acid (pH 6.4); clear smooth boundary.

Bw—2 to 8 inches; yellowish brown (10YR 5/4) coarse sandy loam, dark yellowish brown (10YR 3/4) moist; moderate medium or coarse, subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and few fine roots; common fine interstitial pores; 10 percent gravel; neutral (pH 6.8); clear wavy boundary.

2C—8 to 72 inches; variegated very pale brown (10YR 8/2) and very pale brown (10YR 7/3) gravelly coarse sand with thin strata of very gravelly coarse sand, light yellowish brown (10YR 6/4) moist; single grain; loose, nonsticky and non-plastic; few very fine roots; common fine interstitial pores; 30 percent gravel; neutral (pH 7.2).

### ***Varney Series***

**Taxonomic Class:** Fine-loamy, mixed, superactive, frigid Calcic Argiustolls

#### **Typical Pedon**

Varney clay loam (Colors are for dry soil unless otherwise noted.)

Ap—0 to 5 inches; grayish brown (10YR 5/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate very fine and fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine interstitial pores; 5 percent gravel; neutral (pH 6.6); clear smooth boundary.

- Bt—5 to 16 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; hard, friable, moderately sticky and moderately plastic; many very fine and fine roots; common fine tubular pores; continuous faint clay films on faces of peds; 10 percent gravel; neutral (pH 7.3); clear irregular boundary.
- Bk1—16 to 28 inches; light gray (10YR 7/2) gravelly sandy clay loam, pale brown (10YR 6/3) moist; weak coarse prismatic structure; slightly hard, friable, slightly sticky and nonplastic; common very fine and fine roots; common very fine and fine pores; 5 percent cobbles, 15 percent gravel; common fine masses of lime; violently effervescent; moderately alkaline (pH 7.9); gradual smooth boundary.
- Bk2—28 to 48 inches; very pale brown (10YR 7/3) gravelly sandy loam, pale brown (10YR 6/3) moist; weak coarse prismatic structure; soft, friable, slightly sticky and nonplastic; few fine roots; few fine pores; 5 percent cobbles, 15 percent gravel; disseminated lime; few fine masses of lime; strongly effervescent; moderately alkaline (pH 7.9); clear smooth boundary.
- BC—48 to 60 inches; light brown (7.5YR 6/4) stratified gravelly sandy loam and gravelly loamy sand, brown (7.5YR 5/4) moist; massive; slightly hard, friable, slightly sticky and nonplastic; few fine roots; few fine pores; 5 percent cobbles, 20 percent gravel; slightly effervescent; moderately alkaline (pH 8.4).

### ***Varney Taxadjunct***

**Taxonomic Class:** Fine-loamy, mixed, superactive, frigid Aridic Argiustolls

#### **Typical Pedon**

Varney sandy loam (Colors are for dry soil unless otherwise noted.)

- A—0 to 5 inches; grayish brown (10YR 5/2) sandy loam, very dark grayish brown (10YR 3/2) moist; moderate very fine and fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine interstitial pores; 5 percent gravel; neutral (pH 6.6); clear smooth boundary.
- Bt—5 to 25 inches; brown (10YR 5/3) sandy clay loam, brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; hard, friable, moderately sticky and moderately plastic; many very fine and fine roots; common fine tubular pores; continuous, faint clay films on faces of peds; 10 percent gravel; neutral (pH 7.2); clear irregular boundary.
- BC—25 to 44 inches; very pale brown (10YR 7/3) gravelly sandy loam, pale brown (10YR 6/3) moist; weak coarse prismatic structure; soft, friable, slightly sticky and nonplastic; few fine roots; common very fine and fine interstitial pores; 15 percent gravel; slightly alkaline (pH 7.6); clear smooth boundary.
- C—44 to 60 inches; light brown (7.5YR 6/4) gravelly loamy coarse sand, brown (7.5YR 5/4) moist; single grain; loose, nonsticky and nonplastic; few fine roots; common very fine and fine interstitial pores; 20 percent gravel; slightly alkaline (pH 7.6).

### ***Vendome Series***

**Taxonomic Class:** Sandy-skeletal, mixed, frigid Aridic Haplustolls

#### **Typical Pedon**

Vendome sandy loam (Colors are for dry soil unless otherwise noted.)

- A—0 to 6 inches; brown (10YR 5/3) sandy loam, dark brown (10YR 3/3) moist; moderate fine granular structure; slightly hard, friable, nonsticky and nonplastic; many very fine and fine roots; neutral (pH 7.2); clear smooth boundary.
- Bw—6 to 12 inches; brown (10YR 5/3) sandy loam, dark brown (10YR 4/3) moist; weak medium prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, friable, nonsticky and nonplastic; common very fine and fine roots; neutral (pH 7.2); gradual wavy boundary.
- Bk1—12 to 18 inches; pale brown (10YR 6/3) cobbly sandy loam, brown (10YR 5/3) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; 20 percent cobbles, 5 percent gravel; thin lime coats on undersides of gravel; strongly effervescent; moderately alkaline (pH 8.4); gradual wavy boundary.
- 2Bk2—18 to 30 inches; light brownish gray (10YR 6/2) extremely cobbly loamy sand, brown (10YR 5/3) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; 35 percent cobbles, 40 percent gravel; thin lime coats around gravel; violently effervescent; strongly alkaline (pH 8.6); clear smooth boundary.
- 2Bk3—30 to 60 inches; light brownish gray (10YR 6/2) extremely gravelly loamy sand, brown (10YR 5/3) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; 15 percent cobbles, 60 percent gravel, thin lime coats around gravel; violently effervescent; strongly alkaline (pH 8.6).

## ***Vitroff Series***

**Taxonomic Class:** Fine-loamy, mixed, superactive Vitrandic Haplocryalfs

### **Typical Pedon**

Vitroff ashy loam (Colors are for dry soil unless otherwise noted.)

- Oi—0 to 1 inch; forest litter of slightly decomposed needles, twigs, and roots.
- E1—1 to 3 inches; light brownish gray (10YR 6/2) ashy loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine, fine, medium, and coarse roots; common very fine tubular pores; 2 percent angular gravel; slightly acid (pH 6.2); clear smooth boundary.
- E2—3 to 8 inches; very pale brown (10YR 7/3) ashy loam, very dark grayish brown (10YR 3/2) moist; moderate very fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine, fine, medium, and coarse roots; common very fine tubular pores; 10 percent angular gravel; neutral (pH 6.6); clear smooth boundary.
- Bt and E—8 to 15 inches; Bt part (65 percent) is brown (10YR 4/3) gravelly ashy clay loam lamellae 1/2- to 5/8-inches thick, very dark grayish brown (2.5Y 3/2) moist; E part (35 percent) is very pale brown (10YR 7/3) ashy sandy clay loam, dark grayish brown (2.5Y 4/2) moist; weak medium subangular blocky structure; Bt part is hard, firm, moderately sticky and moderately plastic; E part is slightly hard, friable, slightly sticky and slightly plastic; common very fine, fine, and medium and few coarse roots; common very fine and few fine tubular pores; 5 percent angular cobbles, 20 percent gravel; neutral (pH 6.8); gradual wavy boundary.
- Bt—15 to 33 inches; pale brown (10YR 6/3) gravelly ashy clay loam, dark grayish brown (2.5Y 4/2) moist; weak medium subangular blocky structure; very hard, firm, moderately sticky and moderately plastic; common very fine and few fine and medium roots; common very fine and few fine tubular pores; common faint clay films on faces of peds; 10 percent angular cobbles, 20 percent gravel; neutral (pH 7.2); diffuse wavy boundary.

BC—33 to 60 inches; light gray (10YR 7/2) extremely gravelly ashy coarse sandy loam, olive brown (2.5Y 4/3) moist; massive; loose, nonsticky and nonplastic; few very fine and fine roots in the upper 2 feet; 20 percent angular cobbles, 50 percent gravel; slightly alkaline (pH 7.4).

### ***Whitlash Taxadjunct***

**Taxonomic Class:** Loamy-skeletal, mixed, superactive, frigid Aridic Lithic Haplustolls

#### **Typical Pedon**

Whitlash very gravelly sandy loam (Colors are for dry soil unless otherwise noted.)

A1—0 to 4 inches; dark grayish brown (10YR 4/2) very gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium granular structure; soft, very friable, slightly sticky and slightly plastic; many fine roots; many fine dendritic pores; 10 percent cobbles, 30 percent gravel; slightly acid (pH 6.2); clear smooth boundary.

Bw—4 to 12 inches; grayish brown (10YR 5/2) very gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine roots; many fine dendritic pores; 15 percent cobbles, 35 percent gravel; slightly acid (pH 6.4); clear smooth boundary.

BC—12 to 15 inches; brown (10YR 5/3) very gravelly sandy loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common fine dendritic pores; 15 percent cobbles, 40 percent gravel; neutral (pH 6.6); abrupt smooth boundary.

R—15 to 60 inches; igneous bedrock.

### ***Whitore Series***

**Taxonomic Class:** Loamy-skeletal, carbonatic Typic Eutrocrypts

#### **Typical Pedon**

Whitore channery loam (Colors are for dry soil unless otherwise noted.)

Oi—0 to 2 inches; decomposed and slightly decomposed forest litter.

A—2 to 5 inches; dark grayish brown (10YR 4/2) channery loam, very dark gray (10YR 3/1) moist; weak very fine granular structure; soft, very friable, slightly sticky and slightly plastic; common very fine, fine, medium, and coarse roots; common fine and medium pores; 25 percent channers; slightly alkaline (pH 7.4); clear irregular boundary.

Bw—5 to 14 inches; pale brown (10YR 6/3) channery loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine, fine, medium, and coarse roots; common very fine pores; 25 percent channers; disseminated lime; slightly effervescent; slightly alkaline (pH 7.4); gradual smooth boundary.

Bk1—14 to 25 inches; light gray (10YR 7/2) very channery loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; soft, friable, slightly sticky and slightly plastic; few very fine, fine, medium, and coarse roots, some forming horizontal root mats on rock fragments; 50 percent channers; common distinct lime casts on surface and pendants on undersides of rock fragments; disseminated lime; violently effervescent; strongly alkaline (pH 9.0); gradual wavy boundary.

Bk2—25 to 60 inches; very pale brown (10YR 8/2) extremely channery loam, light brownish gray (10YR 6/2) moist; massive; soft, friable, slightly sticky and slightly

plastic; few very fine, fine, medium, and coarse roots, some forming horizontal root mats on rock fragments; 60 percent channers; many distinct lime casts on surface and pendants on undersides of rock fragments; disseminated lime; violently effervescent; strongly alkaline (pH 9.0); gradual wavy boundary.

## ***Wilspring Series***

**Taxonomic Class:** Loamy-skeletal, mixed, superactive, frigid Typic Haplustepts

### **Typical Pedon**

Wilspring channery loam (Colors are for dry soil unless otherwise noted.)

- A—0 to 3 inches; dark grayish brown (10YR 4/2) channery loam, dark brown (10YR 3/3) moist; moderate medium granular structure; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine interstitial pores; 5 percent flagstones, 20 percent channers; slightly effervescent; slightly alkaline (pH 7.8); clear wavy boundary.
- Bw—3 to 7 inches; brown (10YR 5/3) channery loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many or common very fine and fine tubular and interstitial pores; 5 percent flagstones, 20 percent channers; slightly effervescent; moderately alkaline (pH 8.0); clear wavy boundary.
- Bk1—7 to 12 inches; pale brown (10YR 6/3) very channery loam, yellowish brown (10YR 5/4) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots; many or common very fine and fine tubular and interstitial pores; 5 percent flagstones, 35 percent channers; disseminated lime, common distinct lime coats on undersides of rock fragments; strongly effervescent; moderately alkaline (pH 8.3); gradual wavy boundary.
- Bk2—12 to 24 inches; light gray (10YR 7/2) very channery loam, light yellowish brown (10YR 6/4) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many or common very fine roots; few or common very fine and fine tubular and interstitial pores; 5 percent flagstones, 45 percent channers; disseminated lime, few fine masses of lime, continuous distinct lime crusts on surfaces of rock fragments; violently effervescent; moderately alkaline (pH 8.4); clear smooth boundary.
- R—24 to 60 inches; brown (10YR 5/3) hard fractured shale.

## ***Windham Series***

**Taxonomic Class:** Loamy-skeletal, carbonatic, frigid Typic Calciustolls

### **Typical Pedon**

Windham gravelly clay loam (Colors are for dry soil unless otherwise noted.)

- Ap—0 to 6 inches; dark grayish brown (10YR 4/2) gravelly clay loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; 15 percent limestone gravel; continuous distinct lime casts on undersides of gravel; slightly effervescent; slightly alkaline (pH 7.8); clear wavy boundary.
- Bk1—6 to 12 inches; pale brown (10YR 6/3) gravelly clay loam, brown (10YR 5/3) moist; moderate very fine and fine subangular blocky structure; hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine pores; 20 percent limestone gravel; continuous prominent casts and pendants

on undersides of gravel; disseminated lime; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary.

Bk2—12 to 18 inches; white (10YR 8/2) extremely gravelly loam, very pale brown (10YR 7/3) moist; massive; hard, friable, slightly sticky and nonplastic; many very fine and fine roots; many very fine and fine pores; 5 percent limestone cobbles, 55 percent limestone gravel; common fine masses of lime; continuous prominent lime casts and pendants on undersides of cobbles and gravel; disseminated lime; violently effervescent; moderately alkaline (pH 8.4); diffuse wavy boundary.

Bk3—18 to 61 inches; very pale brown (10YR 7/4) extremely gravelly loam, light yellowish brown (10YR 6/4) moist; massive; slightly hard, friable, slightly sticky and nonplastic; common very fine and fine roots; common or few very fine and fine pores; 10 percent cobbles, 60 percent limestone gravel; common fine masses of lime; continuous distinct lime casts and pendants on undersides of cobbles and gravel; disseminated lime; violently effervescent; moderately alkaline (pH 8.4).

## ***Winspect Series***

**Taxonomic Class:** Loamy-skeletal, mixed, superactive, frigid Typic Calciustolls

### **Typical Pedon**

Winspect cobbly loam (Colors are for dry soil unless otherwise noted.)

A—0 to 4 inches; dark grayish brown (10YR 4/2) cobbly loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; soft, friable, slightly sticky and slightly plastic; many fine and medium roots; common very fine and fine irregular pores; 10 percent cobbles, 10 percent gravel; slightly effervescent; slightly alkaline (pH 7.6); clear smooth boundary.

Ak—4 to 8 inches; brown (10YR 5/3) cobbly loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many fine and medium roots; common very fine irregular pores; 15 percent cobbles, 10 percent gravel; disseminated lime; strongly effervescent; slightly alkaline (pH 7.8); clear wavy boundary.

Bk1—8 to 18 inches; light brownish gray (10YR 6/2) cobbly clay loam, dark grayish brown (10YR 4/2) moist; weak medium subangular structure; hard, friable, moderately sticky and slightly plastic; common very fine and fine roots; common very fine irregular pores; 20 percent cobbles, 10 percent gravel; many medium masses of lime; violently effervescent; moderately alkaline (pH 8.0); gradual wavy boundary.

Bk2—18 to 60 inches; light gray (10YR 7/2) very cobbly clay loam, brown (10YR 5/3) moist; massive; slightly hard, friable, moderately sticky and moderately plastic; few very fine roots; 25 percent cobbles, 25 percent gravel; common medium masses of lime; violently effervescent; moderately alkaline (pH 8.2).

## ***Wissikihon Series***

**Taxonomic Class:** Sandy, mixed Ustic Haplocryolls

### **Typical Pedon**

Wissikihon gravelly coarse sandy loam (Colors are for dry soil unless otherwise noted.)

A1—0 to 3 inches; dark grayish brown (10YR 4/2) gravelly coarse sandy loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; soft, very friable, nonsticky and nonplastic; many very fine, fine, and medium roots; 20 percent fine and medium gravel; slightly acid (pH 6.2); clear smooth boundary.

- A2—3 to 8 inches; dark brown (10YR 3/3) gravelly coarse sandy loam, very dark brown (10YR 2/2) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; many very fine and common fine and medium roots; few very fine and fine tubular pores; 20 percent fine and medium gravel; slightly acid (pH 6.2); clear smooth boundary.
- Bw—8 to 14 inches; brown (10YR 5/3) gravelly coarse sandy loam, brown (10YR 4/3) moist; weak medium prismatic structure parting to weak medium subangular blocky; slightly hard, very friable, slightly sticky and nonplastic; common very fine and fine and few medium roots; few very fine tubular pores; 30 percent fine gravel; slightly acid (pH 6.4); gradual clear boundary.
- BC—14 to 48 inches; light brownish gray (10YR 6/2) very gravelly loamy coarse sand, grayish brown (10YR 5/2) moist; massive; loose, nonsticky and nonplastic; few very fine roots; 35 percent fine gravel; neutral (pH 6.6); gradual wavy boundary.
- Cr—48 to 60 inches; soft, weathered granite bedrock.

## **Work Series**

**Taxonomic Class:** Fine, smectitic, frigid Typic Argiustolls

### **Typical Pedon**

Work clay loam (Colors are for dry soil unless otherwise noted.)

- Ap—0 to 6 inches; grayish brown (10YR 5/2) clay loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; slightly hard, very friable, slightly sticky and moderately plastic; many fine roots; common unstained silt and sand grains; slightly alkaline; clear smooth boundary.
- Bt—6 to 13 inches; dark brown (10YR 4/3) clay, dark brown (10YR 3/3) moist; moderate medium prismatic structure parting to strong fine and medium blocky; very hard, firm, moderately sticky and moderately plastic; many very fine and fine roots; common very fine and fine pores; continuous faint clay films; slightly alkaline; clear smooth boundary.
- Btk—13 to 19 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; moderate medium prismatic structure parting to weak medium blocky; hard, friable, moderately sticky and moderately plastic; common very fine and fine roots; common very fine and fine pores; common faint clay films on vertical faces of peds; 5 percent gravel; common masses of lime; strongly effervescent; moderately alkaline; gradual wavy boundary.
- Bk1—19 to 29 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; weak coarse prismatic structure; hard, friable, moderately sticky and moderately plastic; common or few fine roots; many very fine and fine pores; 10 percent gravel; many masses of lime; continuous distinct lime coats on gravel; violently effervescent; moderately alkaline; gradual wavy boundary.
- Bk2—29 to 42 inches; pale brown (10YR 5/3) gravelly clay loam, dark brown (10YR 4/3) moist; massive; hard, friable, moderately sticky and slightly plastic; few very fine roots; many fine pores; 20 percent gravel; few masses of lime; continuous distinct lime coats on undersides of gravel; strongly effervescent; moderately alkaline; gradual wavy boundary.
- BCK—42 to 60 inches; pale brown (10YR 6/3) gravelly clay loam, dark brown (10YR 4/3) moist; massive; hard, friable, moderately sticky and slightly plastic; 30 percent gravel; disseminated lime; continuous distinct lime coats on undersides of gravel; strongly effervescent; moderately alkaline.

## ***Worock Series***

**Taxonomic Class:** Loamy-skeletal, mixed, superactive Eutric Haplocryalfs

### **Typical Pedon**

Worock gravelly loam (Colors are for dry soil unless otherwise noted.)

Oi—0 to 1 inch; partially decomposed forest litter.

E—1 to 7 inches; light yellowish brown (10YR 6/4) gravelly loam, dark yellowish brown (10YR 4/4) moist; weak medium granular structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine and common medium roots; many very fine and fine irregular pores; 5 percent stones, 5 percent cobbles, 15 percent gravel; moderately acid (pH 5.6); clear smooth boundary.

E/Bt—7 to 18 inches; E part (85 percent) very pale brown (10YR 7/4), Bt part (15 percent) yellowish brown (10YR 5/4) very gravelly clay loam, yellowish brown (10YR 5/6) moist for both parts; weak medium granular structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine and few medium roots; many very fine irregular pores; 5 percent stones, 5 percent cobbles, 25 percent gravel; moderately acid (pH 5.6); clear smooth boundary.

Bt—18 to 28 inches; yellowish brown (10YR 5/6) very gravelly clay loam, dark yellowish brown (10YR 4/6) moist; weak medium subangular blocky structure parting to weak medium granular; hard, firm, moderately sticky and moderately plastic; common very fine and fine roots; common very fine irregular pores; many distinct clay films on faces of peds; 5 percent stones, 10 percent cobbles, 30 percent gravel; moderately acid (pH 5.6); clear smooth boundary.

BC—28 to 62 inches; light yellowish brown (10YR 6/4) very gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, friable, moderately sticky and moderately plastic; few very fine and fine roots; few very fine irregular pores; 5 percent stones, 15 percent cobbles, 35 percent gravel; moderately acid (pH 5.6).

## ***Zbart Series***

**Taxonomic Class:** Loamy-skeletal, mixed, superactive, nonacid, frigid Aridic Lithic Ustorthents

### **Typical Pedon**

Zbart very channery loam (Colors are for dry soil unless otherwise noted.)

A—0 to 7 inches; dark grayish brown (2.5Y 4/2) very channery loam, dark olive gray (5Y 3/2) moist (Colors are lithochromic.); moderate fine granular structure; slightly hard, very friable, slightly sticky and nonplastic; common very fine and fine roots; common very fine and fine pores; 5 percent flagstones, 40 percent channers; slightly acid (pH 6.4); clear wavy boundary.

R—7 to 60 inches; hard fractured shale.

## ***Zbart Taxadjunct***

**Taxonomic Class:** Loamy-skeletal, mixed, superactive, calcareous, frigid Aridic Lithic Ustorthents

### **Typical Pedon**

Zbart very cobbly loam (Colors are for dry soil unless otherwise noted.)



- A—0 to 3 inches; dark grayish brown (2.5Y 4/2) very cobbly loam, very dark grayish brown (2.5Y 3/2) moist (Colors are lithochromic.); moderate fine granular structure; slightly hard, very friable, slightly sticky and nonplastic; common very fine and fine roots; common very fine and fine dendritic pores; 20 percent cobbles, 20 percent gravel; neutral (pH 7.2); clear smooth boundary.
- C—3 to 6 inches; grayish brown (2.5Y 5/2) extremely channery sandy loam, dark grayish brown (2.5 4/2) moist; massive; slightly hard, very friable, slightly sticky and nonplastic; common very fine and fine roots; common very fine and fine interstitial pores; 25 percent flagstones, 40 percent channers; moderately alkaline (pH 7.9); abrupt smooth boundary.
- R—6 to 60 inches; strongly cemented sandstone bedrock.

## ***Zonite Series***

**Taxonomic Class:** Sandy-skeletal, mixed Lithic Cryorthents

### **Typical Pedon**

Zonite very gravelly coarse sandy loam (Colors are for dry soil unless otherwise noted.)

- A—0 to 4 inches; brown (10YR 5/3) very gravelly coarse sandy loam, brown (10YR 4/3) moist; weak fine granular structure; soft, very friable, slightly sticky and nonplastic; common very fine and few fine and medium roots; many very fine interstitial pores; 35 percent, mainly fine, gravel; slightly acid (pH 6.4); clear wavy boundary.
- BC—4 to 9 inches; yellowish brown (10YR 5/4) very gravelly loamy coarse sand, dark yellowish brown (10YR 4/4) moist; single grain; loose, nonsticky and nonplastic; few very fine and fine roots; common very fine interstitial pores; 45 percent, mainly fine, gravel; neutral (pH 6.6); abrupt wavy boundary.
- Cr—9 to 13 inches; soft, weathered granite bedrock.
- R—13 to 60 inches; hard granite bedrock.



# Formation of the Soils

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This section relates the soils in the survey area to the major factors of soil formation.

## Factors of Soil Formation

Soils form through weathering and other processes that act on deposited or accumulated geologic material. Although there are many different soils, the kind of soil that forms depends on the interaction of the type of parent material; the climate to which soil material has been exposed; the relief, or topology, of the land; the plant and animal life in and on the soil; and the length of time that these collective forces have interacted. These factors together are called the soil-forming factors.

The effects of climate and living organisms are conditioned by relief, which influences surface drainage; the amount of water that percolates through the soil; the rate of erosion; and the vegetation potential of the soil. The nature of the parent material also affects the nature of the soil profile that is formed. Time is needed for the climate and organisms to transform parent material into a soil. The development of a distinct soil horizon can require a long period.

The relative importance of each of these factors differs from place to place; in some areas, one factor is more important, and, in other areas, another may dominate. A modification or variation in any of the factors may result in a different kind of soil. Within short distances, the combination of these factors varies, and, consequently, the soils that form may differ in fertility, productivity, and physical and chemical characteristics. In the following paragraphs, the factors of soil formation are further discussed.

### Parent Material

Parent material is the initial physical body that is changed by the other soil-forming factors over time. It strongly affects the chemical and mineralogical composition of the soil. Generally, the influence of parent material diminishes gradually as a soil develops. The nature of the parent material expresses itself clearly in the soil profile, including color, texture, and mineralogy. These properties can be related to physical and chemical properties, susceptibility to erosion, shrink-swell potential, and inherent fertility.

The major parent materials in this soil survey are recent alluvium; much older tertiary-aged alluvium; alluvium, colluvium, and residuum derived from granite, limestone, sandstone, and shale; and a variety of volcanic rock types, both hard and soft.

### Climate

Climate as expressed in air and soil temperature, soil moisture states, and precipitation is an active force in the formation of soils. Climate affects soil formation through its impact on the kind and amount of living organisms in and on the soil. Vegetation and organisms decay to produce organic matter in the soil. Soils that have cool temperatures and high moisture levels generally contain more organic matter and are darker colored. Soils that have warm temperatures and low soil moisture generally contain less organic matter and are lighter colored.

Soils form from rocks that have been weathered by erosion and alternate freezing and thawing. Chemical reactions, such as solution and hydration, further break down this weathered material.

The climate of the Silver Bow County Area and Parts of Beaverhead and Jefferson Counties, Montana, soil survey is relatively cold and dry. The climate is highly variable across the survey area and accounts for significant differences between the soils and related vegetation. Rainfall ranges from 10 to 30 inches. More specific details about the climate in the soil survey area is given in the section [“General Nature of the Survey Area”](#) and in the climate tables. Map unit descriptions provide detailed climate data relative to the area they represent.

### **Topography**

Topography, or relief, is determined by mountain formation and subsequent/concurrent related erosion and glaciation and by the age and resistance of geologic formations to erosion by wind and water. Topography influences soil development through its influence on effectiveness of precipitation, drainage, and runoff. The degree of slope, aspect, shape of the land surface, and permeability of the soil determine the rate of runoff, internal drainage, and soil moisture content.

Slope aspect has an impact on soil formation and related vegetation. East- and north-facing slopes receive less intense solar radiation. As a result, the soils on these slopes remain moister longer and are cooler than soils on west- and south-facing slopes. The surface soil is darker and the depth to lime is generally deeper on north-facing slopes than on south-facing slopes. In much of the survey area, these differences are pronounced.

### **Living Organisms**

Living organisms greatly influence the processes of soil formation and the soil characteristics. Plants, animals, insects, and microorganisms affect gains or losses in organic matter, plant nutrients in the soil, and changes in porosity and structure. The kinds and amounts of living organisms are influenced by soil-forming factors, such as climate and topography.

Roots, rodents, and insects penetrate the soil and alter its structure. The deep, fibrous root system of grasses improves the porosity and structure of the soil. Animal activity is largely concentrated in the upper layers of the soil. Because of this porosity, the activity of microbes, earthworms, and burrowing animals increases. Animals and insects, in turn, increase large channels and pores in the soil by deep burrowing, leaving open channels for the movement of water and air. The soil is continually mixed by this activity.

Plant roots create channels through which air and water move more rapidly, affecting soil structure and increasing the rate of chemical reactions. Deep roots transport minerals and plant nutrients to the surface, improving surface fertility. Under coniferous trees, needles accumulated at the surface increase the soil's acidity.

Microorganisms decompose organic matter, which releases plant nutrients and chemicals into the soil. Some organisms in the soil take in nitrogen from the air and incorporate it into plant tissues. After these organisms die, the nitrogen is released in various forms, becoming available to plants. These nutrients either are used by the plants or are leached from the soil. Human activities that influence plant and animal populations in the soil affect the rate of soil formation.

Soils under forest plant communities tend to be cooler than soils under grassland plant communities. Wet soils may have less oxygen available than better drainer soils.

The native vegetation in the soil survey area varies widely depending on elevation and precipitation. In general, the higher the elevation, the cooler and moister the climate becomes, favoring forested communities. Grassland communities occupy the lower elevations and south aspects of many of the higher elevations.

## Time

The length of time parent materials have been in place and exposed to climate and living organisms is generally reflected in the degree soils have developed. If soil-forming factors have been active for a long time, horizon development is stronger than if they have been active for a relatively short time, assuming a stable landscape. Horizons are described in terms of chemistry, color, consistence, permeability, structure, texture, and thickness.

Some parent materials weather faster than others do. The rate of weathering is dependent on the mineral composition and degree of consolidation and cementation of the parent material. "Time zero" for soil formation is considered the point in time when fresh parent material is first exposed to the soil-forming factors. Examples include a flood, a change in topography resulting from a geologic event, a severe episode of erosion, or the influence of humans on the landscape.

Soils are classified according to their degree of development, an approximation, or proxy, for age, from undeveloped to very old. Age, or maturity, of a soil is generally indicated by thickness and distinctness of subsurface horizons, content of organic matter and clay, depth to which soluble material is leached, and form and distribution of calcium carbonate and gypsum in the soil.

Young soils show very little profile development. Wetsand soils are considered young. They flood at regular frequencies. Therefore, the parent material is constantly renewed and in place only a short time. This soil has had little chance for accumulation of organic matter, and lack of stability results in minimal clay movement within the soil. The soil profile has thin strata of water-lain material that have been little altered, and the soil has lime at the surface.

The Anaconda soil formed in parent material similar to the parent material of the Wetsand soil, but it is on a more stable landform, so the surface is older. The surface layer is darker and thicker than Wetsand soils, and lime has leached to below the surface soil.

Upland soils are a mix of older and younger soils. The degree of soil development depends on landform position, stability, and composition of the parent material. The Bridger soil is an example of a mature, stable soil. It has extensive alteration of the subsoil. Fine clay particles have moved out of the surface soil and been deposited in the subsoil. Lime and soluble minerals have leached out of the subsoil and been redeposited below the subsoil. Passage of time has effected a great deal of change in the original water-lain parent material.

Many sloping and steep, shallow, and very shallow upland soils have been forming for about as long as some of the more developed, less-sloping, stable soils. However, erosion has removed the soil as fast as it formed. In this case, much of the effect of time has been countered by the effect of relief.



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# Glossary

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Many of the terms relating to landforms, geology, and geomorphology are defined in more detail in the *National Soil Survey Handbook* (available in local offices of the Natural Resources Conservation Service or on the Internet at <http://soils.usda.gov/technical/handbook/>).

**Aeration, soil.** The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

**Aggregate, soil.** Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

**Alkali (sodic) soil.** A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

**Alluvial fan.** A low, outspread mass of loose materials and/or rock material, commonly with gentle slopes. It is shaped like an open fan or a segment of a cone. The material was deposited by a stream at the place where it issues from a narrow mountain valley or upland valley or where a tributary stream is near or at its junction with the main stream. The fan is steepest near its apex, which points upstream, and slopes gently and convexly outward (downstream) with a gradual decrease in gradient.

**Alluvium.** Unconsolidated material, such as gravel, sand, silt, clay, and various mixtures of these, deposited on land by running water.

**Alpha,alpha-dipyridyl.** A compound that when dissolved in ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction implies reducing conditions and the likely presence of redoximorphic features.

**Animal-unit-month (AUM).** The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

**Aquic conditions.** Current soil wetness characterized by saturation, reduction, and redoximorphic features.

**Argillic horizon.** A subsoil horizon characterized by an accumulation of illuvial clay.

**Aspect.** The direction toward which a slope faces. Also called slope aspect.

**Association, soil.** A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

**Available water capacity (available moisture capacity).** The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low .....	0 to 3
Low .....	3 to 6
Moderate .....	6 to 9

High ..... 9 to 12

Very High..... more than 12

- Backslope.** The position that forms the steepest and generally linear, middle portion of a hillslope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.
- Badland.** A landscape that is intricately dissected and characterized by a very fine drainage network with high drainage densities and short, steep slopes and narrow interfluvies. Badlands develop on surfaces that have little or no vegetative cover overlying unconsolidated or poorly cemented materials (clays, silts, or sandstones) with, in some cases, soluble minerals, such as gypsum or halite.
- Basal area.** The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.
- Base saturation.** The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.
- Base slope** (geomorphology). A geomorphic component of hills consisting of the concave to linear (perpendicular to the contour) slope that, regardless of the lateral shape, forms an apron or wedge at the bottom of a hillside dominated by colluvium and slope-wash sediments (for example, slope alluvium).
- Bedding plane.** A planar or nearly planar bedding surface that visibly separates each successive layer of stratified sediment or rock (of the same or different lithology) from the preceding or following layer; a plane of deposition. It commonly marks a change in the circumstances of deposition and may show a parting, a color difference, a change in particle size, or various combinations of these. The term is commonly applied to any bedding surface, even one that is conspicuously bent or deformed by folding.
- Bedrock.** The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.
- Bedrock-controlled topography.** A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.
- Bisequum.** Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.
- Blowout.** A saucer-, cup-, or trough-shaped depression formed by wind erosion on a preexisting dune or other sand deposit, especially in an area of shifting sand or loose soil or where protective vegetation is disturbed or destroyed; the adjoining accumulation of sand derived from the depression, where recognizable, is commonly included. Blowouts are commonly small.
- Bottom land.** An informal term loosely applied to various portions of a flood plain.
- Boulders.** Rock fragments larger than 2 feet (60 centimeters) in diameter.
- Breaks.** A landscape or tract of steep, rough or broken land dissected by ravines and gullies and marking a sudden change in topography.
- Breast height.** An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.
- Brush management.** Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.
- Cable yarding.** A method of moving felled trees to a nearby central area for transport to a processing facility. Most cable yarding systems involve use of a drum, a pole, and wire cables in an arrangement similar to that of a rod and reel used for fishing. To reduce friction and soil disturbance, felled trees generally are reeled in while one end is lifted or the entire log is suspended.

- Calcareous soil.** A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.
- Canopy.** The leafy crown of trees or shrubs. (See Crown.)
- Canyon.** A long, deep, narrow valley with high, precipitous walls in an area of high local relief.
- Capillary water.** Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.
- Catena.** A sequence, or “chain,” of soils on a landscape that formed in similar kinds of parent material and under similar climatic conditions but that have different characteristics as a result of differences in relief and drainage.
- Cation.** An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.
- Cation-exchange capacity.** The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.
- Channery soil material.** Soil material that has, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.
- Chemical treatment.** Control of unwanted vegetation through the use of chemicals.
- Chiseling.** Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.
- Cirque.** A steep-walled, semicircular or crescent-shaped, half-bowl-like recess or hollow, commonly situated at the head of a glaciated mountain valley or high on the side of a mountain. It was produced by the erosive activity of a mountain glacier. It commonly contains a small round lake (tarn).
- Clay.** As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.
- Clay depletions.** See Redoximorphic features.
- Clay film.** A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.
- Claypan.** A dense, compact, slowly permeable subsoil layer that contains much more clay than the overlying materials, from which it is separated by a sharply defined boundary. A claypan is commonly hard when dry and plastic and sticky when wet.
- Climax plant community.** The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.
- Coarse textured soil.** Sand or loamy sand.
- Cobble** (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.
- Cobbly soil material.** Material that has 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.
- COLE** (coefficient of linear extensibility). See Linear extensibility.
- Colluvium.** Unconsolidated, unsorted earth material being transported or deposited on side slopes and/or at the base of slopes by mass movement (e.g., direct gravitational action) and by local, unconcentrated runoff.
- Complex slope.** Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.
- Complex, soil.** A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them

separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

**Concretions.** See Redoximorphic features.

**Conglomerate.** A coarse grained, clastic sedimentary rock composed of rounded or subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer textured material. Conglomerate is the consolidated equivalent of gravel.

**Conservation cropping system.** Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

**Conservation tillage.** A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

**Consistence, soil.** Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the *Soil Survey Manual*.

**Control section.** The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

**Coprogenous earth** (sedimentary peat). A type of limnic layer composed predominantly of fecal material derived from aquatic animals.

**Corrosion.** (soil survey interpretations). Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

**Cover crop.** A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

**Crop residue management.** Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

**Cropping system.** Growing crops according to a planned system of rotation and management practices.

**Crown.** The upper part of a tree or shrub, including the living branches and their foliage.

**Cryoturbate.** A mass of soil or other unconsolidated earthy material moved or disturbed by frost action. It is typically coarser than the underlying material.

**Culmination of the mean annual increment (CMAI).** The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

**Cutbanks cave** (in tables). The walls of excavations tend to cave in or slough.

**Decreasers.** The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be diminished by overgrazing.

**Deferred grazing.** Postponing grazing or resting grazing land for a prescribed period.

**Dense layer** (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

**Depth, soil.** Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

**Diatomaceous earth.** A geologic deposit of fine, grayish siliceous material composed chiefly or entirely of the remains of diatoms.

**Dip slope.** A slope of the land surface, roughly determined by and approximately conforming to the dip of the underlying bedrock.

**Diversion** (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

**Drainage class** (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained. These classes are defined in the *Soil Survey Manual*.

**Drainage, surface.** Runoff, or surface flow of water, from an area.

**Drainageway.** A general term for a course or channel along which water moves in draining an area. A term restricted to relatively small, linear depressions that at some time move concentrated water and either do not have a defined channel or have only a small defined channel.

**Draw.** A small stream valley that generally is shallower and more open than a ravine or gulch and that has a broader bottom. The present stream channel may appear inadequate to have cut the drainageway that it occupies.

**Drift.** A general term applied to all mineral material (clay, silt, sand, gravel, and boulders) transported by a glacier and deposited directly by or from the ice or transported by running water emanating from a glacier. Drift includes unstratified material (till) that forms moraines and stratified deposits that form outwash plains, eskers, kames, varves, and glaciofluvial sediments. The term is generally applied to Pleistocene glacial deposits in areas that no longer contain glaciers.

**Duff.** A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and grades from litter on the surface to underlying humus.

**Draw.** A small stream valley that generally is shallower and more open than a ravine or gulch and that has a broader bottom. The present stream channel may appear inadequate to have cut the drainageway that it occupies.

**Dune.** A low mound, ridge, bank, or hill of loose, windblown granular material (generally sand), either barren and capable of movement from place to place or covered and stabilized with vegetation but retaining its characteristic shape.

**Earthy fill.** See Mine spoil.

**Ecological site.** An area where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. An ecological site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other ecological sites in kind and/or proportion of species or in total production.

**Eluviation.** The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

**Endosaturation.** A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

**Eolian deposit.** Sand-, silt-, or clay-sized clastic material transported and deposited primarily by wind, commonly in the form of a dune or a sheet of sand or loess.

- Ephemeral stream.** A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.
- Episaturation.** A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.
- Erosion.** The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.
- Erosion* (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains.  
Synonym: natural erosion.
- Erosion* (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or catastrophic in nature, such as fire, that exposes the surface.
- Erosion surface.** A land surface shaped by the action of erosion, especially by running water.
- Escarpment.** A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Most commonly applied to cliffs produced by differential erosion. Synonym: scarp.
- Extrusive rock.** Igneous rock derived from deep-seated molten matter (magma) deposited and cooled on the earth's surface.
- Fallow.** Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is managed for at least one growing season for weed control and decomposition of plant residue.
- Fan remnant.** A general term for landforms that are the remaining parts of older fan landforms, such as alluvial fans, that have been either dissected or partially buried.
- Fertility, soil.** The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.
- Fibric soil material (peat).** The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.
- Field moisture capacity.** The moisture content of a soil, expressed as a percentage of the oven-dry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called normal field capacity, normal moisture capacity, or capillary capacity.
- Fill slope.** A sloping surface consisting of excavated soil material from a road cut. It commonly is on the downhill side of the road.
- Fine-textured soil.** Sandy clay, silty clay, or clay.
- Firebreak.** An area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of firefighters and equipment. Designated roads also serve as firebreaks.
- Flaggy soil material.** Material that has, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.
- Flagstone.** A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.
- Flood plain.** The nearly level plain that borders a stream and is subject to flooding unless protected artificially.

- Flood-plain landforms.** A variety of constructional and erosional features produced by stream channel migration and flooding. Examples include backswamps, flood-plain splays, meanders, meander belts, meander scrolls, oxbow lakes, and natural levees.
- Flood-plain splay.** A fan-shaped deposit or other outspread deposit formed where an overloaded stream breaks through a levee (natural or artificial) and deposits its material (commonly coarse grained) on the flood plain.
- Flood-plain step.** An essentially flat, terrace-like alluvial surface within a valley that is frequently covered by floodwater from the present stream; any approximately horizontal surface still actively modified by fluvial scour and/or deposition. May occur individually or as a series of steps.
- Fluvial.** Of or pertaining to rivers or streams; produced by stream or river action.
- Foothills.** A region of steeply sloping hills that fringes a mountain range or high-plateau escarpment. The hills have relief of as much as 1,000 feet (300 meters).
- Footslope.** The concave surface at the base of a hillslope. A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).
- Forb.** Any herbaceous plant not a grass or a sedge.
- Forest cover.** All trees and other woody plants (underbrush) covering the ground in a forest.
- Forest type.** A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.
- Fragipan.** A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.
- Genesis, soil.** The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.
- Gilgai.** Commonly, a succession of microbasins and microknolls in nearly level areas or of microvalleys and microridges parallel with the slope. Typically, the microrelief of clayey soils that shrink and swell considerably with changes in moisture content.
- Glaciofluvial deposits.** Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur in the form of outwash plains, valley trains, deltas, kames, eskers, and kame terraces.
- Glaciolacustrine deposits.** Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial meltwater. Many deposits are bedded or laminated.
- Gleyed soil.** Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.
- Grassed waterway.** A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.
- Gravel.** Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.
- Gravelly soil material.** Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.
- Green manure crop** (agronomy). A soil-improving crop grown to be terminated in an early stage of maturity or soon after maturity.
- Ground water.** Water filling all the unblocked pores of the material below the water table.

**Gully.** A small channel with steep sides caused by erosion and cut in unconsolidated materials by concentrated but intermittent flow of water. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

**Hard bedrock.** Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

**Hard to reclaim** (in tables). Reclamation is difficult after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

**Hardpan.** A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

**Head out.** To form a flower head.

**Head slope** (geomorphology). A geomorphic component of hills consisting of a laterally concave area of a hillside, especially at the head of a drainageway. The overland waterflow is converging.

**Hemic soil material** (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.

**High-residue crops.** Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

**Hill.** A generic term for an elevated area of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline. The distinction between a hill and a mountain is arbitrary and may depend on local usage.

**Hillslope.** A generic term for the steeper part of a hill between its summit and the drainage line, valley flat, or depression floor at the base of a hill.

**Horizon, soil.** A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the *Soil Survey Manual*. The major horizons of mineral soil are as follows:

*O horizon.*—An organic layer of fresh and decaying plant residue.

*A horizon.*—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

*E horizon.*—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

*B horizon.*—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

*C horizon.*—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

*Cr horizon.*—Soft, consolidated bedrock beneath the soil.



*R horizon*.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

**Humus.** The well decomposed, more or less stable part of the organic matter in mineral soils.

**Hydrologic soil groups.** Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

**Igneous rock.** Rock that was formed by cooling and solidification of magma and that has not been changed appreciably by weathering since its formation. Major varieties include plutonic and volcanic rock (e.g., andesite, basalt, and granite).

**Illuviation.** The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

**Impacted, moderately.** Moderately impacted soils generally have good ground coverage, but plant species present are mainly restricted to those tolerant of the effects of surface mining and smelting activities.

**Impacted, severely.** Severely impacted soils have substantial barren areas, and the plant species present are only those that can tolerate the extreme effects of surface mining and smelting activities.

**Impervious soil.** A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

**Increasers.** Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

**Infiltration.** The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

**Infiltration capacity.** The maximum rate at which water can infiltrate into a soil under a given set of conditions.

**Infiltration rate.** The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

**Intake rate.** The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2 .....	very low
0.2 to 0.4 .....	low
0.4 to 0.75 .....	moderately low
0.75 to 1.25 .....	moderate
1.25 to 1.75 .....	moderately high
1.75 to 2.5 .....	high
More than 2.5 .....	very high

**Interfluv.** A landform composed of the relatively undissected upland or ridge between two adjacent valleys containing streams flowing in the same general direction. An elevated area between two drainageways that sheds water to those drainageways.

**Intermittent stream.** A stream, or reach of a stream, that does not flow year-round but that is commonly dry for 3 or more months out of 12 and whose channel is

generally below the local water table. It flows only during wet periods or when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

**Invaders.** On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Also, these plants invade following disturbance of the surface.

**Iron depletions.** See Redoximorphic features.

**Irrigation.** Application of water to soils to assist in production of crops. Methods of irrigation are:

*Basin.*—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

*Border.*—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

*Controlled flooding.*—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

*Corrugation.*—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

*Drip (or trickle).*—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

*Furrow.*—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

*Sprinkler.*—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

*Subirrigation.*—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

*Wild flooding.*—Water, released at high points, is allowed to flow onto an area without controlled distribution.

**Knoll.** A small, low, rounded hill rising above adjacent landforms.

**$K_{sat}$ .** Saturated hydraulic conductivity. (See Permeability.)

**Lacustrine deposit.** Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

**Lake plain.** A nearly level surface marking the floor of an extinct lake filled by well sorted, generally fine textured, stratified deposits, commonly containing varves.

**Lake terrace.** A narrow shelf, partly cut and partly built, produced along a lakeshore in front of a scarp line of low cliffs and later exposed when the water level falls.

**Landslide.** A general, encompassing term for most types of mass movement landforms and processes involving the downslope transport and outward deposition of soil and rock materials caused by gravitational forces; the movement may or may not involve saturated materials. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

**Large stones** (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

**Leaching.** The removal of soluble material from soil or other material by percolating water.

**Linear extensibility.** Refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Linear extensibility is used to determine the shrink-swell potential of soils. It is an expression of the volume change between the water content of the clod at 1/3- or 1/10-bar tension (33kPa or 10kPa tension) and oven dryness. Volume change is influenced by the amount and type of clay minerals in the soil. The volume change is the percent change for the whole soil. If it is expressed as a fraction, the resulting value is COLE, coefficient of linear extensibility.

**Liquid limit.** The moisture content at which the soil passes from a plastic to a liquid state.

**Loam.** Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

**Loess.** Material transported and deposited by wind and consisting dominantly of silt-sized particles.

**Low strength.** The soil is not strong enough to support loads.

**Marl.** An earthy, unconsolidated deposit consisting chiefly of calcium carbonate mixed with clay in approximately equal proportions; formed primarily under freshwater lacustrine conditions but also formed in more saline environments.

**Mass movement.** A generic term for the dislodgment and downslope transport of soil and rock material as a unit under direct gravitational stress.

**Masses.** See Redoximorphic features.

**Meander belt.** The zone within which migration of a meandering channel occurs; the flood-plain area included between two imaginary lines drawn tangential to the outer bends of active channel loops.

**Mechanical treatment.** Use of mechanical equipment for seeding, brush management, and other management practices.

**Medium-textured soil.** Very fine sandy loam, loam, silt loam, or silt.

**Mesa.** A broad, nearly flat topped and commonly isolated landmass bounded by steep slopes or precipitous cliffs and capped by layers of resistant, nearly horizontal rocky material. The summit width is characteristically greater than the height of the bounding escarpments.

**Metamorphic rock.** Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement at depth in the earth's crust. Nearly all such rocks are crystalline.

**Mine spoil.** An accumulation of displaced earthy material, rock, or other waste material removed during mining or excavation. Also called earthy fill.

**Mineral soil.** Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

**Minimum tillage.** Only the tillage essential to crop production and prevention of soil damage.

**Miscellaneous area.** A kind of map unit component that has little or no natural soil and supports little or no vegetation.

**Miscellaneous water.** A sewage lagoon, an industrial waste pit, a fish hatchery, or a similar water area.

**Moderately coarse-textured soil.** Coarse sandy loam, sandy loam, or fine sandy loam.

**Moderately fine-textured soil.** Clay loam, sandy clay loam, or silty clay loam.

**Mollic epipedon.** A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

**Moraine.** In terms of glacial geology, a mound, ridge, or other topographically distinct accumulation of unsorted, unstratified drift, predominantly till, deposited primarily by the direct action of glacial ice in a variety of landforms. Also, a general term for a landform composed mainly of till (except for kame moraines, which are composed mainly of stratified outwash) that has been deposited by a glacier. Some types of moraines are disintegration, end, ground, kame, lateral, recessional, and terminal.

**Morphology, soil.** The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

**Mottling, soil.** Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—few, common, and many; size—fine, medium, and coarse; and contrast—faint, distinct, and prominent. The size

measurements are of the diameter along the greatest dimension. Fine indicates less than 5 millimeters (about 0.2 inch); medium, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and coarse, more than 15 millimeters (about 0.6 inch).

**Mountain.** A generic term for an elevated area of the land surface, rising more than 1,000 feet (300 meters) above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides. A mountain can occur as a single, isolated mass or in a group forming a chain or range. Mountains are formed primarily by tectonic activity and/or volcanic action but can also be formed by differential erosion.

**Muck.** Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

**Mudstone.** A blocky or massive, fine grained sedimentary rock in which the proportions of clay and silt are approximately equal. Also, a general term for such material as clay, silt, claystone, siltstone, shale, and argillite and that should be used only when the amounts of clay and silt are not known or cannot be precisely identified.

**Munsell notation.** A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

**Natric horizon.** A special kind of argillic horizon that contains enough exchangeable sodium to have an adverse effect on the physical condition of the subsoil.

**Neutral soil.** A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

**Nodules.** See Redoximorphic features.

**Nose slope** (geomorphology). A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent. Nose slopes consist dominantly of colluvium and slope-wash sediments (for example, slope alluvium).

**Nutrient, plant.** Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

**Organic matter.** Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low .....	less than 0.5 percent
Low .....	0.5 to 1.0 percent
Moderately low.....	1.0 to 2.0 percent
Moderate.....	2.0 to 4.0 percent
High .....	4.0 to 8.0 percent
Very high.....	more than 8.0 percent

**Outwash.** Stratified and sorted sediments (chiefly sand and gravel) removed or “washed out” from a glacier by meltwater streams and deposited in front of or beyond the end moraine or the margin of a glacier. The coarser material is deposited nearer to the ice.

**Outwash fan.** A fan-shaped accumulation of outwash deposited by meltwater streams in front of the end or recessional moraine of a glacier. Coalescing outwash fans form an outwash plain.

**Outwash plain.** An extensive lowland area of coarse textured glaciofluvial material. An outwash plain is commonly smooth; where pitted, it generally is low in relief.

**Outwash terrace.** A flat-topped bank of outwash with an abrupt outer face (scarp or riser) extending along a valley downstream from an outwash plain or terminal moraine; a valley train deposit.

- Paleoterrace.** An erosional remnant of a terrace that retains the surface form and alluvial deposits of its origin but was not emplaced by, and commonly does not grade to, a present-day stream or drainage network.
- Pan.** A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan*, *fragipan*, *claypan*, *plowpan*, and *traffic pan*.
- Parent material.** The unconsolidated organic and mineral material in which soil forms.
- Peat.** Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)
- Ped.** An individual natural soil aggregate, such as a granule, a prism, or a block.
- Pedisediment.** A layer of sediment, eroded from the shoulder and backslope of an erosional slope, that lies on and is being (or was) transported across a gently sloping erosional surface at the foot of a receding hill or mountain slope.
- Pedon.** The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.
- Percolation.** The movement of water through the soil.
- Permafrost.** Ground, soil, or rock that remains at or below 0 degrees C for at least 2 years. It is defined on the basis of temperature and is not necessarily frozen.
- Permeability.** The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the *Soil Survey Manual*. In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:
- |                        |                        |
|------------------------|------------------------|
| Impermeable.....       | less than 0.0015 inch  |
| Very slow .....        | 0.0015 to 0.06 inch    |
| Slow .....             | 0.06 to 0.2 inch       |
| Moderately slow.....   | 0.2 to 0.6 inch        |
| Moderate .....         | 0.6 inch to 2.0 inches |
| Moderately rapid ..... | 2.0 to 6.0 inches      |
| Rapid .....            | 6.0 to 20 inches       |
| Very rapid .....       | more than 20 inches    |
- pH value.** A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)
- Phase, soil.** A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.
- Piping** (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.
- Pitting** (in tables). Pits caused by melting around ice. They form on the soil after plant cover is removed.
- Plastic limit.** The moisture content at which a soil changes from semisolid to plastic.
- Plasticity index.** The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.
- Plateau** (geomorphology). A comparatively flat area of great extent and elevation; specifically, an extensive land region that is considerably elevated (more than 100 meters) above the adjacent lower lying terrain, is commonly limited on at least one side by an abrupt descent, and has a flat or nearly level surface. A comparatively large part of a plateau surface is near summit level.
- Playa.** The generally dry and nearly level lake plain that occupies the lowest parts of closed depressions, such as those on intermontane basin floors. Temporary flooding occurs primarily in response to precipitation and runoff. Playa deposits are fine grained and may or may not have a high water table and saline conditions.

**Plowpan.** A compacted layer formed in the soil directly below the plowed layer.

**Ponding.** Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

**Poorly graded.** Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

**Pore linings.** See Redoximorphic features.

**Potential native plant community.** See Climax plant community.

**Potential rooting depth** (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

**Prescribed burning.** Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

**Productivity, soil.** The capability of a soil for producing a specified plant or sequence of plants under specific management.

**Profile, soil.** A vertical section of the soil extending through all its horizons and into the parent material.

**Proper grazing use.** Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

**Rangeland.** Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

**Reaction, soil.** A measure of acidity or alkalinity of a soil, expressed as pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid .....	less than 3.5
Extremely acid .....	3.5 to 4.4
Very strongly acid.....	4.5 to 5.0
Strongly acid .....	5.1 to 5.5
Moderately acid.....	5.6 to 6.0
Slightly acid.....	6.1 to 6.5
Neutral .....	6.6 to 7.3
Slightly alkaline .....	7.4 to 7.8
Moderately alkaline .....	7.9 to 8.4
Strongly alkaline.....	8.5 to 9.0
Very strongly alkaline .....	9.1 and higher

**Red beds.** Sedimentary strata that are mainly red and are made up largely of sandstone and shale.

**Redox concentrations.** See Redox features.

**Redox depletions.** See Redox features.

**Redox features.** Redoximorphic features are associated with wetness and result from alternating periods of reduction and oxidation of iron and manganese compounds in the soil. Reduction occurs during saturation with water, and oxidation occurs when the soil is not saturated. Characteristic color patterns are created by these processes. The reduced iron and manganese ions may be removed from a soil if vertical or lateral fluxes of water occur, in which case there is no iron or manganese precipitation in that soil. Wherever the iron and manganese are

oxidized and precipitated, they form either soft masses or hard concretions or nodules. Movement of iron and manganese as a result of redoximorphic processes in a soil may result in redoximorphic features that are defined as follows:

1. Redox concentrations.—These are zones of apparent accumulation of iron-manganese oxides, including:
  - A. Nodules and concretions, which are cemented bodies that can be removed from the soil intact. Concretions are distinguished from nodules on the basis of internal organization. A concretion typically has concentric layers that are visible to the naked eye. Nodules do not have visible organized internal structure; *and*
  - B. Masses, which are noncemented concentrations of substances within the soil matrix; *and*
  - C. Pore linings, i.e., zones of accumulation along pores that may be either coats on pore surfaces or impregnations from the matrix adjacent to the pores.
2. Redox depletions.—These are zones of low chroma (chromas less than those in the matrix) where either iron-manganese oxides alone or both iron-manganese oxides and clay have been stripped out, including:
  - A. Iron depletions, i.e., zones that contain low amounts of iron and manganese oxides but have a clay content similar to that of the adjacent matrix; *and*
  - B. Clay depletions, i.e., zones that contain low amounts of iron, manganese, and clay (often referred to as silt coats or skeletans).
3. Reduced matrix.—This is a soil matrix that has low chroma *in situ* but undergoes a change in hue or chroma within 30 minutes after the soil material has been exposed to air.

**Reduced matrix.** See Redoximorphic features.

**Regolith.** All unconsolidated earth materials above the solid bedrock. It includes material weathered in place from all kinds of bedrock and alluvial, glacial, eolian, lacustrine, and pyroclastic deposits.

**Relief.** The relative difference in elevation between the upland summits and the lowlands or valleys of a given region.

**Residuum** (residual soil material). Unconsolidated, weathered, or partly weathered mineral material that accumulated as bedrock weathers in place.

**Rill.** A very small, steep-sided channel resulting from erosion and cut in unconsolidated materials by concentrated but intermittent flow of water. A rill generally is not an obstacle to wheeled vehicles and is shallow enough to be smoothed over by ordinary tillage.

**Riser.** The vertical or steep side slope (e.g., escarpment) of terraces, flood-plain steps, or other stepped landforms; commonly a recurring part of a series of natural, steplike landforms, such as successive stream terraces.

**Road cut.** A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

**Rock fragments.** Rock or mineral fragments having a diameter of 2 millimeters or more; for example, gravel, cobbles, stones, and boulders.

**Root zone.** The part of the soil that can be penetrated by plant roots.

**Runoff.** The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without soaking into the soil is called surface runoff.

**Saline soil.** A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

**Sand.** As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

**Sandstone.** Sedimentary rock containing dominantly sand-sized particles.

**Sapric soil material** (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

**Saturated hydraulic conductivity ( $K_{sat}$ ).** See Permeability.

**Saturation.** Wetness characterized by zero or positive pressure of the soil water.

Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

**Scarification.** The act of abrading, scratching, loosening, crushing, or modifying the surface to increase water absorption or to provide a more tillable soil.

**Sedimentary rock.** A consolidated deposit of clastic particles, chemical precipitates, or organic remains accumulated at or near the surface of the earth under normal low temperature and pressure conditions. Sedimentary rocks include consolidated equivalents of alluvium, colluvium, drift, and eolian, lacustrine, and marine deposits. Examples are sandstone, siltstone, mudstone, claystone, shale, conglomerate, limestone, dolomite, and coal.

**Sequum.** A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

**Series, soil.** A group of soils that have profiles that are almost alike. All the soils of a given series have horizons that are similar in composition, thickness, and arrangement.

**Shale.** Sedimentary rock that formed by the hardening of a deposit of clay, silty clay, or silty clay loam and that has a tendency to split into thin layers.

**Sheet erosion.** The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

**Shoulder.** The convex, erosional surface near the top of a hillslope. A shoulder is a transition from summit to backslope.

**Shrink-swell** (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

**Side slope** (geomorphology). A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel. Side slopes are dominantly colluvium and slope-wash sediments.

**Silica.** A combination of silicon and oxygen. The mineral form is called quartz.

**Silica-sesquioxide ratio.** The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.

**Silt.** As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

**Siltstone.** An indurated silt having the texture and composition of shale but lacking its fine lamination or fissility; a massive mudstone in which silt predominates over clay.

**Similar soils.** Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

**Sinkhole.** A closed, circular or elliptical depression, commonly funnel shaped, characterized by subsurface drainage and formed either by dissolution of the surface of underlying bedrock (e.g., limestone, gypsum, or salt) or by collapse of underlying caves within bedrock. Complexes of sinkholes in carbonate-rock terrain are the main components of karst topography.

**Site index.** A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height



attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

**Slickensides** (pedogenic). Grooved, striated, and/or glossy (shiny) slip faces on structural peds, such as wedges; produced by shrink-swell processes, most commonly in soils that have a high content of expansive clays.

**Slope.** The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey, classes for simple slopes are as follows:

Nearly level.....	0 to 2 percent
Gently sloping.....	2 to 4 percent
Moderately sloping.....	4 to 8 percent
Strongly sloping .....	8 to 15 percent
Moderately steep .....	15 to 25 percent
Steep .....	25 to 45 percent
Very steep.....	more than 45 percent

**Slope alluvium.** Sediment gradually transported down the slopes of mountains or hills primarily by nonchannel alluvial processes (i.e., slope-wash processes) and characterized by particle sorting. Lateral particle sorting is evident on long slopes. In a profile sequence, sediments may be distinguished by differences in size and/or specific gravity of rock fragments and may be separated by stone lines. Burnished peds and sorting of rounded or subrounded gravel or cobbles distinguish these materials from unsorted colluvial deposits.

**Slow refill** (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

**Sodic (alkali) soil.** A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

**Sodicity.** The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of  $\text{Na}^+$  to  $\text{Ca} + \text{Mg}^+$ . The degrees of sodicity and their respective ratios are:

Slight .....	less than 13:1
Moderate .....	13-30:1
Strong.....	more than 30:1

**Sodium adsorption ratio (SAR).** A measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration.

**Soft bedrock.** Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

**Soil.** A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief and by the passage of time.

**Soil separates.** Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand.....	2.0 to 1.0
Coarse sand .....	1.0 to 0.5
Medium sand .....	0.5 to 0.25
Fine sand.....	0.25 to 0.10
Very fine sand.....	0.10 to 0.05

Silt.....0.05 to 0.002

Clay..... less than 0.002

**Solum.** The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

**Stone line.** In a vertical cross section, a line formed by scattered fragments or a discrete layer of angular and subangular rock fragments (commonly a gravel- or cobble-sized lag concentration) that formerly was draped across a topographic surface and was later buried by additional sediments. A stone line generally caps material that was subject to weathering, soil formation, and erosion before burial. Many stone lines seem to be buried erosion pavements, originally formed by sheet and rill erosion across the land surface.

**Stones.** Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

**Stony.** Refers to a soil containing stones in numbers that interfere with or prevent tillage.

**Strath terrace.** A type of stream terrace; formed as an erosional surface cut on bedrock and thinly mantled with stream deposits (alluvium).

**Stream terrace.** One of a series of surfaces in a stream valley, flanking and more or less parallel to the stream channel, originally formed near the level of the stream; represents the remnants of an abandoned flood plain, stream bed, or valley floor produced during a former state of fluvial erosion or deposition.

**Structure, soil.** The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

**Stubble mulch.** Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

**Subsoil.** Technically, the B horizon; roughly, the part of the solum below plow depth.

**Subsoiling.** Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

**Substratum.** The part of the soil below the solum.

**Subsurface layer.** Any surface soil horizon (A, E, AB, or EB) below the surface layer.

**Summer fallow.** Management of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

**Summit.** The topographically highest position of a hillslope. It has a nearly level (planar or slightly convex) surface.

**Surface layer.** The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the “plow layer,” or the “Ap horizon.”

**Surface soil.** The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

**Talus.** Rock fragments of any size or shape (commonly coarse and angular) derived from and lying at the base of a cliff or very steep rock slope. The accumulated mass of such loose broken rock formed chiefly by falling, rolling, or sliding.

**Taxadjuncts.** Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

**Terminal moraine.** An end moraine that marks the farthest advance of a glacier. It typically has the form of a massive arcuate or concentric ridge, or complex of ridges, and is underlain by till and other types of drift.

**Terrace (geomorphology).** A steplike surface, bordering a valley floor or shoreline, that represents the former position of a flood plain, lake, or seashore. The term is usually applied both to the relatively flat summit surface (tread) that was cut or built by stream or wave action and to the steeper descending slope (scarp or riser) that has graded to a lower base level of erosion.

**Terracettes.** Small, irregular steplike forms on steep hillslopes, especially in pasture, formed by creep or erosion of surficial materials that may be induced or enhanced by trampling of livestock, such as sheep or cattle.

**Texture, soil.** The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay, and clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

**Thin layer** (in tables). Otherwise suitable soil material that is too thin for the specified use.

**Till.** Dominantly unsorted and nonstratified drift, generally unconsolidated and deposited directly by a glacier without subsequent reworking by meltwater, and consisting of a heterogeneous mixture of clay, silt, sand, gravel, stones, and boulders; rock fragments of various lithologies are embedded within a finer matrix that can range from clay to sandy loam.

**Tilth, soil.** The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

**Toeslope.** The gently inclined surface at the base of a hillslope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors.

**Topsoil.** The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

**Trace elements.** Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

**Tread.** The flat to gently sloping, topmost, laterally extensive slope of terraces, flood-plain steps, or other stepped landforms; commonly a recurring part of a series of natural steplike landforms, such as successive stream terraces.

**Tuff.** A generic term for any consolidated or cemented deposit that is 50 percent or more volcanic ash.

**Upland.** An informal, general term for the higher ground of a region, in contrast with a low-lying adjacent area, such as a valley or plain, or for land at a higher elevation than the flood plain or low stream terrace; land above the footslope zone of the hillslope continuum.

**Valley fill.** The unconsolidated sediment deposited by any agent (water, wind, ice, or mass wasting) so as to fill or partly fill a valley.

**Variation.** Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

**Varve.** A sedimentary layer or a lamina or sequence of laminae deposited in a body of still water within a year. Specifically, a thin pair of graded glaciolacustrine layers

seasonally deposited, usually by meltwater streams, in a glacial lake or other body of still water in front of a glacier.

**Water bars.** Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.

**Weathering.** All physical disintegration, chemical decomposition, and biologically induced changes in rocks or other deposits at or near the earth's surface by atmospheric or biologic agents or by circulating surface waters but involving essentially no transport of the altered material.

**Well graded.** Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

**Wilting point** (or permanent wilting point). The moisture content of soil, on an oven-dry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

**Windthrow.** The uprooting and tipping over of trees by the wind.

# Tables

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Silver Bow County Area and Parts of Beaverhead and Jefferson Counties, Montana

Freeze Dates in Spring and Fall

(Recorded in the period 1971 through 2000 at Butte Bert Mooney Airport)

Probability	Temperature		
	24 degrees F or lower	28 degrees F or lower	32 degrees F or lower
Last freezing temperature in spring: January-July			
1 year in 10 later than----	May 22	June 17	July 7
2 years in 10 later than----	May 17	June 10	July 1
5 years in 10 later than----	May 6	May 27	June 20
First freezing temperature in fall: August-December			
1 year in 10 earlier than---	September 11	September 5	August 21
2 years in 10 earlier than--	September 16	September 8	August 25
5 years in 10 earlier than--	September 26	September 15	September 3

Silver Bow County Area and Parts of Beaverhead and Jefferson Counties, Montana

Growing Season

(Recorded in the period 1971 through 2000 at Butte Bert Mooney Airport)

Probability	Daily minimum temperature		
	Higher than 24 degrees F	Higher than 28 degrees F	Higher than 32 degrees F
	Days	Days	Days
9 years in 10-----	118	86	52
8 years in 10-----	126	94	59
5 years in 10-----	141	110	74
2 years in 10-----	156	126	89
1 year in 10-----	163	134	97

# Silver Bow County Area and Parts of Beaverhead and Jefferson Counties, Montana

## Temperature and Precipitation

(Recorded in the period 1971 through 2000 at Butte Bert Mooney Airport)

Month	Temperature (degrees F)					Precipitation (inches)					
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have—		Average number of growing- degree days*	Average	2 years in 10 will have—		Average number of days with 0.10 or more	Average Total Snowfall
				Maximum temperature more than	Minimum temperature less than			less than	more than		
January-----	29.7	5.4	17.6	52	-34	17	0.53	0.21	0.81	1	8.3
February-----	34.7	9.6	22.2	55	-31	23	0.47	0.22	0.68	1	7.6
March-----	42.1	18.5	30.3	65	-15	37	0.83	0.51	1.13	3	10.9
April-----	51.6	26.4	39.0	76	5	113	1.02	0.46	1.50	4	8.9
May-----	60.8	34.3	47.6	83	18	254	2.02	1.12	2.81	6	3.3
June-----	70.7	41.4	56.1	89	28	481	2.07	0.91	3.06	6	0.2
July-----	79.8	45.5	62.7	94	32	701	1.47	0.44	2.30	5	0.0
August-----	79.0	44.1	61.6	94	31	667	1.36	0.56	2.04	4	0.3
September----	67.8	35.3	51.6	89	18	353	1.09	0.30	1.72	3	1.1
October-----	55.5	26.2	40.9	78	1	98	0.79	0.29	1.20	3	4.5
November-----	38.9	15.3	27.1	63	-20	38	0.60	0.29	0.86	2	7.6
December-----	29.9	5.7	17.8	51	-33	14	0.53	0.23	0.78	2	8.8
Yearly:											
Average-----	53.4	25.6	39.5	—	—	—	—	—	—	—	—
Extreme-----	99.0	-52.0	—	95	-42	—	—	—	—	—	—
Total-----	—	—	—	—	—	2,796	12.78	9.67	15.68	39	61.6
Average # of days per year with at least 1 inch of snow on the ground: 62											

\* A growing-degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40 degrees F).

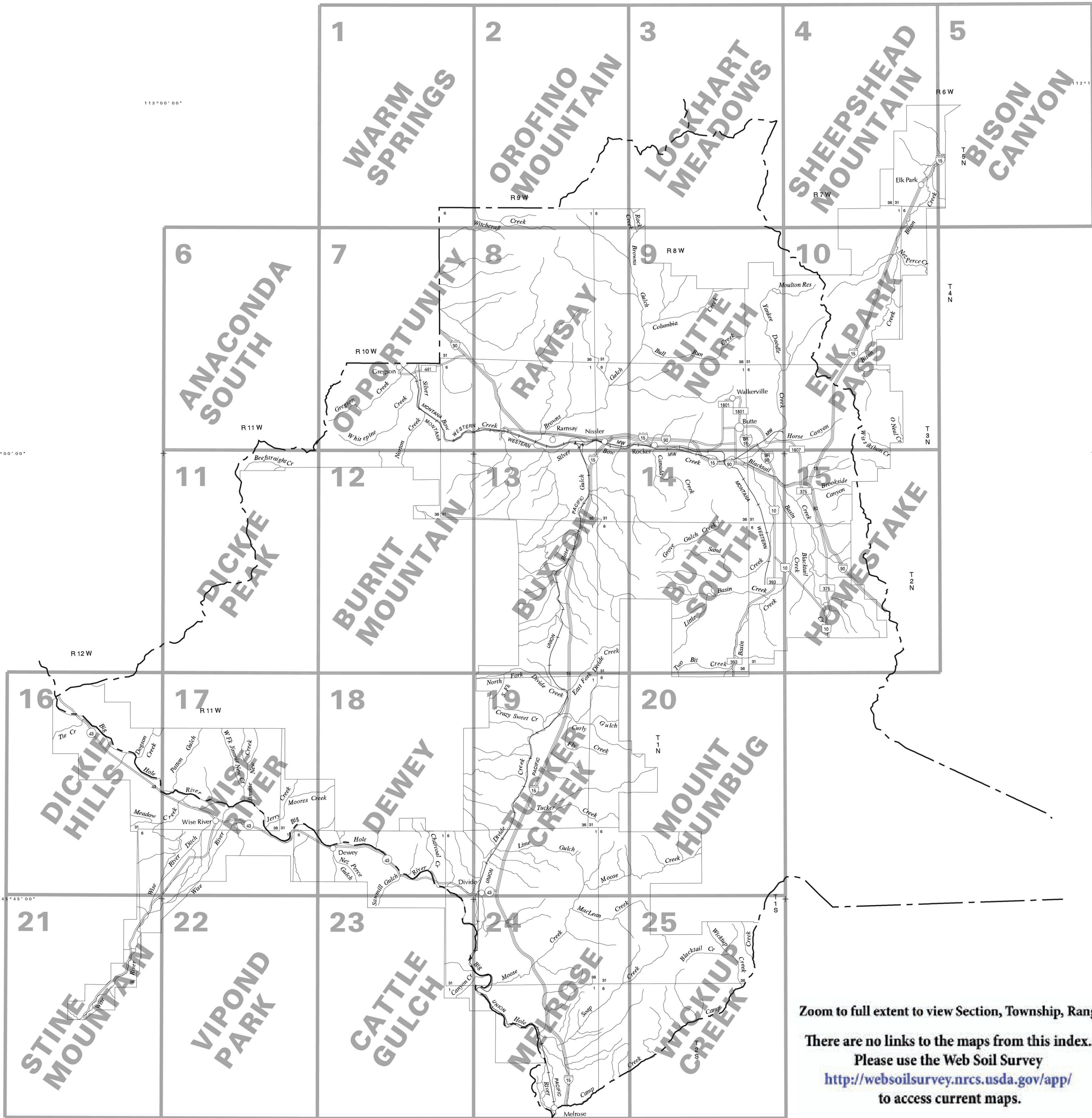


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Zoom to full extent to view Section, Township, Range.

There are no links to the maps from this index.

Please use the Web Soil Survey

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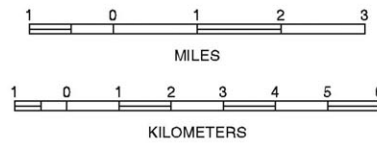
to access current maps.

SECTIONALIZED TOWNSHIP					
6	5	4	3	2	1
7	8	9	10	11	12
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INDEX TO MAP SHEETS

SILVER BOW COUNTY AREA AND  
PARTS OF BEAVERHEAD AND JEFFERSON COUNTIES, MONTANA



SCALE = 1:145000



SOIL LEGEND

The publication symbols consist of field symbols. Map symbols consist of numbers, letters, or a combination of numbers and letters, for example, 998, W, and 10A. Map units are arranged numerically by publication symbols.

SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
10A	Slickens-Aquic Cumulic Haplustolls, occasionally flooded-Aridic Ustifluvents, occasionally flooded complex, 0 to 2 percent slopes, severely impacted	110E	Danielvil-Bearmouth complex, 2 to 25 percent slopes	315F	Stecum-Hiore complex, 20 to 50 percent slopes
11A	Mannixlee-Bonebasin complex, 0 to 4 percent slopes, frequently flooded	111E	Sebud-Philipsburg complex, 8 to 25 percent slopes, bouldery	316F	Stecum, very bouldery-Rock outcrop-Zonite, very bouldery complex, 20 to 50 percent slopes
12A	Riverrun, occasionally flooded-Mannixlee, frequently flooded complex, 0 to 4 percent slopes	112E	Monaberg-Bridger-Libeg, stony complex, 8 to 25 percent slopes	317E	Stecum-Caseypeak-Rock outcrop complex, 8 to 35 percent slopes
15B	Anamac-Varney-Rivra, rarely flooded complex, 0 to 6 percent slopes	114B	Varney loam, 0 to 4 percent slopes, moderately impacted	319D	Silas, stony-Branham, stony-Tepete complex, 2 to 15 percent slopes
21C	Kilgore, occasionally flooded-Foolhen, rarely flooded-Philipsburg complex, 2 to 12 percent slopes	115D	Philipsburg-Ratiopeak complex, 8 to 15 percent slopes	321E	Beeftail-Bavdark-Zonite complex, 8 to 35 percent slopes
22B	Philipsburg loam, 1 to 4 percent slopes, stony	116C	Monaberg-Philipsburg complex, 2 to 8 percent slopes	323E	Highrye-Tuggle, very stony-Moosejaw complex, 2 to 25 percent slopes
24B	Kilgore, occasionally flooded-Mooseflat, rarely flooded-Philipsburg complex, 0 to 6 percent slopes	118E	Reedpoint-Rock outcrop-Sixbeacon complex, 6 to 45 percent slopes	324E	Beeftail, stony-Branham, stony-Fleecer complex, 8 to 20 percent slopes
25D	Work, stony-Adel-Kilgore, rarely flooded complex, 2 to 15 percent slopes	119C	Varney-Udecide complex, 2 to 12 percent slopes, moderately impacted	326C	Fleecer-Branham-Passmore complex, 2 to 8 percent slopes
26C	Mooseflat, occasionally flooded-Bridger-Kilgore, rarely flooded complex, 0 to 8 percent slopes	120C	Varney-Anamac complex, 2 to 8 percent slopes	327E	Highrye-Stecum-Wissikihon complex, 15 to 30 percent slopes
27D	Savenac-Bridger complex, 4 to 15 percent slopes	122C	Varney-Work complex, 2 to 8 percent slopes	328E	Stecum-Zonite-Basincreek complex, 8 to 45 percent slopes
28C	Kilgore-Danielvil complex, 2 to 8 percent slopes	123E	Sebud, stony-Danielvil-Monaberg, very stony complex, 8 to 30 percent slopes	331C	Mooseflat, occasionally flooded-Foolhen, occasionally flooded-Fleecer complex, 2 to 8 percent slopes
31A	Philipsburg cobbly loam, 0 to 4 percent slopes, very stony	124E	Monaberg-Bridger complex, 8 to 30 percent slopes, very stony	332D	Bobowic-Goldflint complex, 4 to 25 percent slopes
32B	Kilgore, occasionally flooded-Danielvil complex, 1 to 4 percent slopes	125E	Libeg-Monaberg complex, 15 to 35 percent slopes, very bouldery	333E	Stecum-Hiore-Rock outcrop complex, 15 to 35 percent slopes
33B	Sebud very cobbly loam, 2 to 6 percent slopes, very stony	126E	Danielvil, very bouldery-Monaberg, bouldery-Adel complex, 8 to 35 percent slopes	335E	Stecum-Goldflint-Branham complex, 12 to 35 percent slopes
34A	Danielvil-Danielvil, rarely flooded complex, 0 to 4 percent slopes	128D	Monaberg loam, 4 to 15 percent slopes, bouldery	340E	Peeler gravelly sandy loam, 8 to 25 percent slopes, stony
36A	Foolhen-Monaberg-Mooseflat complex, 0 to 4 percent slopes	129D	Philipsburg-Danielvil complex, 4 to 15 percent slopes	344A	Valleyflat complex, 0 to 2 percent slopes
37B	Mooseflat, occasionally flooded-Monaberg, rarely flooded complex, 1 to 4 percent slopes	131E	Dumps, placer mining-Philipsburg, stony complex, 4 to 15 percent slopes	345D	Adit, moderately impacted, stony-Rock outcrop complex, 4 to 15 percent slopes
38B	Rivra gravelly sandy loam, 0 to 4 percent slopes, moderately impacted	136D	Varney-Varney, stony-Anamac complex, 2 to 12 percent slopes	347D	Nully-Modess complex, 2 to 12 percent slopes, moderately impacted
40B	Cetrack loam, 0 to 4 percent slopes, moderately impacted	139D	Beeftail, occasionally flooded-Adel-Monaberg complex, 4 to 15 percent slopes	348E	Adit, moderately impacted, stony-Rock outcrop-Modess, moderately impacted complex, 8 to 30 percent slopes
42D	Varney-Varney, stony-Anamac, stony complex, 2 to 12 percent slopes, moderately impacted	140D	Monaberg-Adel complex, 4 to 20 percent slopes	349D	Modess-Anaconda complex, 2 to 15 percent slopes, moderately impacted
43B	Meadowcreek-Mannixlee, rarely flooded complex, 0 to 4 percent slopes	141F	Danielvil-Danielvil, cool-Philipsburg complex, 15 to 45 percent slopes	353C	Highrye-Wissikihon-Beeftail complex, 2 to 8 percent slopes
44A	Meadowcreek-Anamac complex, 1 to 6 percent slopes, moderately impacted	142E	Ratiopeak-Philipsburg complex, 15 to 35 percent slopes, very stony	356E	Peeler-Bobowic-Zonite complex, 8 to 30 percent slopes
46B	Varney-Rivra complex, 0 to 4 percent slopes	145D	Danielvil-Philipsburg complex, 4 to 12 percent slopes	357D	Beeftail-Dinnen-Tuggle complex, 4 to 25 percent slopes
47B	Foolhen-Monaberg-Kilgore, occasionally flooded complex, 0 to 6 percent slopes	147B	Philipsburg-Ratiopeak complex, 1 to 6 percent slopes	360B	Tepete mucky peat, 1 to 4 percent slopes, rarely flooded
50A	Bonebasin, occasionally flooded-Meadowcreek, rarely flooded complex, 0 to 4 percent slopes, moderately impacted	148C	Philipsburg-Monaberg complex, 2 to 8 percent slopes	361G	Rock outcrop-Goldflint-Rubble land complex, 45 to 80 percent slopes
51D	Foxgulch-Libeg complex, 6 to 25 percent slopes, stony	149D	Bridger-Libeg complex, 8 to 25 percent slopes, very stony	362E	Comad-Stecum complex, 8 to 30 percent slopes
53C	Sixbeacon-Sieben complex, 2 to 8 percent slopes	150D	Sebud, very stony-Ratiopeak, stony-Bridger, stony complex, 4 to 15 percent slopes	363C	Tepete mucky peat, sandy substratum, 2 to 6 percent slopes
55A	Bonebasin, occasionally flooded-Monaberg, very rarely flooded-Meadowcreek, rarely flooded complex, 0 to 4 percent slopes	152E	Sieben-Varney complex, 15 to 45 percent slopes, very stony	364F	Comad-Goldflint-Rock outcrop complex, 20 to 50 percent slopes
56B	Bonebasin, occasionally flooded-Meadowcreek, rarely flooded complex, 0 to 4 percent slopes	153D	Sebud, very stony-Philipsburg-Ratiopeak, very stony complex, 4 to 15 percent slopes	365F	Stecum-Rock outcrop-Goldflint complex, 30 to 60 percent slopes
58B	Varney-Anaconda loams, 0 to 4 percent slopes, moderately impacted	158C	Varney-Anamac-Anaconda complex, 2 to 8 percent slopes	366F	Stecum-Rock outcrop-Basincreek complex, 25 to 50 percent slopes
59A	Anamac-Meadowcreek complex, 0 to 2 percent slopes	159E	Monaberg-Varney-Philipsburg complex, 8 to 35 percent slopes	367G	Rubble land-Stecum-Zonite complex, 35 to 75 percent slopes
60A	Riverrun-Rivra complex, 0 to 2 percent slopes	160E	Bridger-Patouza, stony-Varney complex, 8 to 45 percent slopes	369E	Rubick, bouldery-Comad, very bouldery complex, 8 to 30 percent slopes
61A	Rivra, stony-Riverrun complex, 0 to 2 percent slopes	161C	Philipsburg-Philipsburg, stony-Danielvil complex, 2 to 8 percent slopes	370C	Comad-Bobowic complex, 2 to 8 percent slopes, bouldery
62A	Vendome-Sieben complex, 0 to 2 percent slopes	162B	Monaberg loam, 1 to 4 percent slopes	371G	Stecum-Rock outcrop-Comad complex, 35 to 70 percent slopes
64A	Work clay loam, 0 to 4 percent slopes	164B	Danielvil loam, moist, 1 to 4 percent slopes	372E	Basincreek-Peeler-Stecum complex, 15 to 45 percent slopes
65B	Sebud-Bearmouth complex, 1 to 4 percent slopes, very stony	165A	Mooseflat, rarely flooded-Foxgulch, very rarely flooded complex, 0 to 4 percent slopes	373E	Hiore-Caseypeak-Rock outcrop complex, 15 to 45 percent slopes
67A	Foxgulch-Bearmouth, very stony complex, 0 to 4 percent slopes	166B	Kilgore-Foolhen-Monaberg complex, 0 to 4 percent slopes	374B	Valleyflat sandy loam, 1 to 4 percent slopes
68B	Bearmouth, rarely flooded-Foxgulch, occasionally flooded complex, 0 to 4 percent slopes, very stony	167C	Monaberg loam, 2 to 8 percent slopes, stony	375E	Valleyflat-Pitchstone complex, 8 to 30 percent slopes
69B	Foxgulch loam, 1 to 4 percent slopes	168E	Sebud-Sieben complex, 8 to 30 percent slopes, stony	376A	Cometcrik, rarely flooded-Histic Endoaquolls, rarely flooded-Passmore, very rarely flooded complex, 0 to 4 percent slopes
71D	Sebud-Ratiopeak complex, 4 to 15 percent slopes, stony	169E	Sebud-Sieben complex, 8 to 30 percent slopes	377B	Valleyflat-Pitchstone complex, 1 to 4 percent slopes
72B	Tibson gravelly loam, 1 to 4 percent slopes	170E	Ratiopeak, very stony-Bridger-Adel complex, 8 to 30 percent slopes	378C	Valleyflat-Pitchstone complex, 4 to 8 percent slopes
74A	Bearmouth very cobbly sandy loam, 0 to 2 percent slopes, very stony	171D	Varney-Sieben, stony complex, 4 to 15 percent slopes	379F	Pitchstone-Rockerjohn complex, 15 to 50 percent slopes, extremely bouldery
75A	Danielvil loam, 0 to 2 percent slopes	172F	Ratiopeak-Sixbeacon-Tiban complex, 15 to 45 percent slopes, extremely stony	380D	Beeftail-Dinnen-Rock outcrop complex, 4 to 15 percent slopes
76A	Bearmouth very cobbly sandy loam, 0 to 4 percent slopes	173B	Monaberg-Foolhen complex, 1 to 6 percent slopes	382B	Varney-Anaconda-Varney, sandy substratum complex, 1 to 4 percent slopes
80A	Water-Riverwash complex	174C	Philipsburg loam, 2 to 8 percent slopes	383C	Highrye-Beeftail-Oro Fino complex, 1 to 8 percent slopes
81A	Varney sandy loam, 0 to 4 percent slopes	175B	Foolhen-Kilgore complex, 0 to 4 percent slopes	384E	Minestope, extremely bouldery-Branham, extremely bouldery-Rock outcrop complex, 8 to 35 percent slopes
82D	Philipsburg-Monaberg-Kilgore, occasionally flooded complex, 0 to 15 percent slopes	177C	Udecide-Gnojek, stony complex, 2 to 8 percent slopes	385D	Highrye-Beeftail complex, 4 to 15 percent slopes
82E	Elve gravelly loam, 15 to 35 percent slopes	178E	Rootel-Varney complex, 8 to 30 percent slopes	386D	Varney-Con complex, 8 to 15 percent slopes
85E	Loberg gravelly loam, 15 to 35 percent slopes	179F	Vendome, extremely stony-Sixbeacon complex, 25 to 60 percent slopes	389C	Anaconda-Rockerjohn complex, 1 to 8 percent slopes, moderately impacted
101B	Philipsburg sandy loam, 1 to 4 percent slopes	182C	Varney, stony-Anamac, very stony-Rivra, extremely stony complex, 2 to 8 percent slopes	390D	Rockerjohn-Valleyflat complex, 4 to 20 percent slopes, very stony, moderately impacted
102D	Varney, noncalclc-Philipsburg-Varney complex, 2 to 15 percent slopes	183B	Anamac-Varney complex, 1 to 6 percent slopes	392F	Bobowic, very bouldery-Comad, very bouldery-Rock outcrop complex, 20 to 50 percent slopes
106E	Gnojek-Libeg-Philipsburg complex, 8 to 30 percent slopes, stony	235B	Anaconda sandy loam, 0 to 4 percent slopes, severely impacted	394E	Minestope, very stony-Beeftail, very stony-Rock outcrop complex, 8 to 30 percent slopes
107E	Anaconda-Varney-Work, stony complex, 6 to 30 percent slopes	272F	Rencot, stony-Spudbar-Rock outcrop complex, 25 to 50 percent slopes	395E	Beeftail-Stecum-Wissikihon complex, 8 to 25 percent slopes
108D	Varney-Work complex, 4 to 15 percent slopes, stony	301E	Philipsburg-Beeftail, bouldery-Danielvil complex, 8 to 30 percent slopes	397E	Anaconda, sandy substratum-Anaconda-Valleyflat complex, 8 to 45 percent slopes, moderately impacted
109A	Bearmouth coarse sandy loam, 0 to 4 percent slopes	303D	Moosejaw, occasionally flooded-Highrye-Silas, occasionally flooded complex, 2 to 12 percent slopes	400C	Anaconda-Varney complex, 2 to 8 percent slopes, moderately impacted
		305D	Beeftail-Branham-Minestope complex, 2 to 15 percent slopes		
		306E	Wissikihon-Branham-Highrye complex, 8 to 30 percent slopes		
		312D	Oro Fino-Highrye-Branham complex, 4 to 15 percent slopes		
		313E	Beeftail-Dinnen-Highrye complex, 8 to 45 percent slopes		
		314F	Basincreek-Comad complex, 20 to 50 percent slopes		

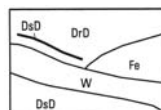
SOIL LEGEND

SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
401D	Modess-Adit-Rockerjohn complex, 4 to 12 percent slopes, moderately impacted	561F	Euell-Bigbutte complex, 20 to 50 percent slopes, stony	756D	Passcreek-Poin, stony complex, 6 to 20 percent slopes
402E	Typic Cryorthents, reclaimed area-Beeftail, severely impacted complex, 4 to 30 percent slopes	562G	Poin, very stony-Rubble land-Eastridge, very stony complex, 25 to 70 percent slopes	757F	Surdal-Sigbird-Mawspring complex, 15 to 60 percent slopes, very stony
404E	Beeftail-Minestope-Dinnen complex, 4 to 25 percent slopes, moderately impacted	564D	Chinasprings-Patouza-Nivean complex, 4 to 15 percent slopes, stony	761E	Quincreek, very stony-Whitlash, very stony-Rock outcrop complex, 12 to 35 percent slopes
405E	Minestope-Beeftail, very bouldery-Nuley complex, 8 to 30 percent slopes	567F	Evapo-Eastridge complex, 20 to 50 percent slopes	801F	Skaggs, extremely stony-Skaggs, very stony-Rock outcrop complex, 20 to 60 percent slopes
406E	Stecum, very bouldery-Comad-Rock outcrop complex, 8 to 30 slopes	568F	Evapo-Coslaw-Hungryhill complex, 15 to 50 percent slopes	802E	Starley-Tropical complex, 12 to 40 percent slopes
407D	Adit-Adit, moist-Rock outcrop complex, 8 to 25 percent slopes	569E	Evapo-Savenac complex, 15 to 30 percent slopes	803E	Sieben very cobbly loam, 12 to 30 percent slopes, stony
408E	Stecum-Mooseflat-Basincreek complex, 4 to 30 percent slopes, very bouldery	570E	Eastridge-Euell complex, 15 to 40 percent slopes	805C	Sixbeacon, stony-Bronec complex, 2 to 8 percent slopes
409E	Stecum, moderately impacted, very stony-Rock outcrop-Zonite, moderately impacted, very bouldery complex, 8 to 30 percent slopes	572D	Euell-Nissler-Poin complex, 4 to 20 percent slopes, stony	806D	Sieben very cobbly loam, 4 to 12 percent slopes
410E	Bobowic-Peeler-Caseypeak complex, 15 to 45 percent slopes	573E	Whitlash, very stony-Rock outcrop-Hungryhill, very stony complex, 8 to 30 percent slopes	807E	Pensore, stony-Roto complex, 8 to 30 percent slopes
411D	Modess-Nuley complex, 4 to 12 percent slopes	578D	Whitlash, very stony-Rock outcrop-Reedpoint, very stony, complex, 4 to 15 percent slopes	808F	Pensore, stony-Rock outcrop complex, 20 to 45 percent slopes
412E	Stecum, stony-Zonite, stony-Rock outcrop complex, 15 to 35 percent slopes	579D	Chinasprings-Dutton complex, 4 to 15 percent slopes, moderately impacted	809G	Pensore, stony-Rock outcrop complex, 45 to 70 percent slopes
413E	Modess-Adit-Rock outcrop complex, 4 to 35 percent slopes	580E	Patouza-Chinasprings-Nivean complex, 8 to 30 percent slopes, moderately impacted	810F	Whitore, very stony-Skaggs-very stony-Rock outcrop complex, 20 to 50 percent slopes
414G	Rock outcrop-Stecum-Comad complex, 30 to 90 percent slopes	584F	Nivean, very stony-Rock outcrop-Whitlash, very stony complex, 20 to 60 percent slopes	811G	Whitore-Skaggs complex, 40 to 70 percent slopes, very stony
415F	Stecum-Goldflint-Basincreek complex, 20 to 50 percent slopes, extremely stony	586D	Chinasprings-Patouza-Chinasprings, deep complex, 4 to 15 percent slopes, moderately impacted	812F	Whitore, moist-Skaggs complex, 20 to 50 percent slopes, very stony
416E	Beeftail-Fleecer-Stecum complex, 8 to 45 percent slopes	587E	Nivean very gravely sandy loam, 15 to 30 percent slopes, moderately impacted	813F	Whitore, stony-Whitore complex, 20 to 60 percent slopes
417E	Fleecer-Tuggle complex, 8 to 30 percent slopes	589E	Nivean-Patouza complex, 8 to 35 percent slopes, very stony, moderately impacted	814E	Whitore complex, 12 to 45 percent slopes, stony
419E	Peeler-Comad complex, 8 to 30 percent slopes, very stony	593F	Nivean-Patouza-Whitlash complex, 20 to 50 percent slopes, very stony, moderately impacted	816G	Whitore, very stony-Tropical, very stony-Rock outcrop complex, 45 to 80 percent slopes
420B	Dinnen-Wissikihon-Shewag complex, 1 to 6 percent slopes	594D	Evapo-Savenac complex, 4 to 15 percent slopes	817E	Whitore, very stony-Raynesford complex, 15 to 40 percent slopes
421B	Shewag-Shewag, moderately well drained complex, 1 to 4 percent slopes	595D	Mooseflat, very stony-Pappascreek, very stony-Euell complex, 2 to 15 percent slopes	818D	Raynesford-Whitore, very stony complex, 4 to 20 percent slopes
423D	Fleecer-Dinnen complex, 4 to 15 percent slopes	596D	Bigbutte, stony-Euell, stony-Rock outcrop complex, 4 to 15 percent slopes	819D	Raynesford-Whitore complex, 4 to 15 percent slopes, stony
501C	Patouza-Chinasprings-Dutton complex, 2 to 8 percent slopes, moderately impacted	597C	Kilgore-Foolhen-Philipsburg complex, 2 to 12 percent slopes	820E	Whitore, stony-Tropical, very stony-Raynesford, stony complex, 12 to 45 percent slopes
502E	Hungryhill-Savenac complex, 8 to 30 percent slopes, stony	598E	Chinasprings-Whitlash-Dutton complex, 8 to 30 percent slopes, stony	823E	Skaggs-Raynesford-Tropical, very stony complex, 8 to 35 percent slopes
503F	Bridger-Eastridge-Hungryhill complex, 25 to 60 percent slopes, very stony	601D	Nissler-Kilgore-Pappascreek, very stony complex, 2 to 15 percent slopes	825E	Skaggs-Whitore complex, 12 to 35 percent slopes, stony
504E	Bullrey-Hungryhill-Larkspur complex, 8 to 30 percent slopes, very stony	608E	Illiano, very stony-Euell, very stony-Rock outcrop complex, 8 to 30 percent slopes	826E	Raynesford-Whitore-Skaggs complex, 12 to 30 percent slopes
505E	Chinasprings-Euell-Nissler complex, 8 to 30 percent slopes, stony	612A	Kilgore, frequently flooded-Foxgulch, rarely flooded complex, 0 to 4 percent slopes	830D	Kalsted gravely sandy loam, 8 to 15 percent slopes
507C	Chinasprings ashy sandy loam, 2 to 8 percent slopes, stony, moderately impacted	614B	Brownsgulch-Foxgulch complex, 2 to 6 percent slopes	901E	Sebud-Poin-Tiban complex, 15 to 45 percent slopes, extremely stony
508F	Eastridge-Judco complex, 20 to 60 percent slopes	616D	Silas-Vitroff complex, 2 to 15 percent slopes	904D	Sebud, stony-Redchief complex, 8 to 25 percent slopes
509D	Bridger-Nissler complex, 4 to 15 percent slopes	701E	Rubick-Stecum complex, 15 to 45 percent slopes	905E	Tigeron, stony-Rubick, very stony complex, 15 to 45 percent slopes
510F	Euell, very stony-Hungryhill, very stony-Rock outcrop complex, 30 to 60 percent slopes	702E	Maurice, very stony-Maurice-Sigbird, very stony complex, 12 to 35 percent slopes	906E	Rubick, very stony-Tigeron, stony complex, 15 to 45 percent slopes
511E	Hungryhill-Euell-Larkspur complex, 8 to 30 percent slopes, stony	703G	Surdal, very stony-Rubble land complex, 30 to 70 percent slopes	907F	Sebud, extremely stony-Rubick, very stony complex, 25 to 60 percent slopes
512E	Euell-Larkspur complex, 8 to 30 percent slopes, stony, moderately impacted	706E	Rubick-Libeg complex, 8 to 35 percent slopes	908E	Sebud-Tiban-Ratiopeak complex, 12 to 30 percent slopes, stony
513E	Euell, very stony-Illiano, moderately impacted, very stony-Rock outcrop complex, 8 to 30 percent slopes	708D	Rubick-Moosejaw complex, 4 to 20 percent slopes	909G	Rubick, rubbly-Rubble land complex, 40 to 75 percent slopes
514E	Hungryhill-Euell-Poin complex, 8 to 35 percent slopes	709E	Libeg-Monad-Copenhaver complex, 15 to 35 percent slopes	910F	Sebud-Ratiopeak complex, 20 to 50 percent slopes, very stony
515F	Eastridge-Hungryhill-Poin complex, 20 to 50 percent slopes, very stony	710E	Worock gravely loam, dry, 15 to 35 percent slopes	911E	Sebud, stony-Adel complex, 12 to 30 percent slopes
516F	Eastridge-Germangulch complex, 25 to 60 percent slopes, very stony	711E	Worock gravely loam, 15 to 35 percent slopes	912D	Ratiopeak-Redchief complex, 4 to 15 percent slopes, stony
517D	Poin-Larkspur complex, 4 to 20 percent slopes	712F	Rubick-Maurice complex, 20 to 50 percent slopes, very stony	913E	Rubick gravely sandy loam, 8 to 30 percent slopes
518F	Germangulch-Eastridge-Euell complex, 25 to 60 percent slopes, very stony	713F	Elve gravely loam, 35 to 60 percent slopes	920G	Poin, rubbly-Rubble land-Rock outcrop complex, 40 to 80 percent slopes
519E	Eastridge-Euell complex, 15 to 30 percent slopes, very stony	715G	Worock, dry-Rubick complex, 30 to 70 percent slopes	921F	Whitlash-Frenchcreek complex, 20 to 50 percent slopes, rubbly
522D	Foolhen, rarely flooded-Silas-Vitroff complex, 2 to 15 percent slopes	716G	Tiban-Sigbird-Maurice complex, 35 to 75 percent slopes	923F	Whitore, rubbly-Poin, rubbly-Rock outcrop complex, 25 to 60 percent slopes
523E	Nissler-Euell complex, 12 to 30 percent slopes	717E	Libeg-Loberg complex, 8 to 30 percent slopes	924F	Whitlash, extremely stony-Gnojek, extremely stony-Rock outcrop complex, 20 to 60 percent slopes
525G	Eastridge gravely ashy loam, 45 to 75 percent slopes	718E	Maurice-Libeg complex, 8 to 30 percent slopes, very stony	926F	Rubick-Tigeron complex, 30 to 60 percent slopes, very stony
527E	Patouza-Nivean-Chinasprings complex, 8 to 30 percent slopes	719G	Tiban, very stony-Sigbird, very stony-Rubble land complex, 35 to 75 percent slopes	927E	Tigeron, very stony-Rubick, very stony-Tigeron, stony complex, 15 to 45 percent slopes
528E	Poin-Rock outcrop-Euell complex, 8 to 30 percent slopes	721E	Ratiopeak-Sigbird complex, 15 to 40 percent slopes, very stony	928E	Mawspring-Maurice complex, 15 to 45 percent slopes, very stony
530E	Bigbutte, stony-Poin, stony-Brownsgulch complex, 8 to 25 percent slopes	724E	Winspect gravely loam, 8 to 30 percent slopes	929F	Rubick, very stony-Poin, extremely bouldery complex, 25 to 60 percent slopes
532E	Hungryhill-Poin-Larkspur complex, 15 to 45 percent slopes, stony	725E	Winspect-Wilspring complex, 8 to 30 percent slopes	930F	Ratiopeak-Tiban complex, 25 to 60 percent slopes, very stony
534D	Chinasprings-Travona complex, 4 to 15 percent slopes, moderately impacted	726C	Anaconda sandy loam, 0 to 4 percent slopes	931E	Ratiopeak-Monaberg complex, 8 to 30 percent slopes, very stony
536F	Hungryhill, very stony-Euell, very stony-Poin extremely stony complex, 25 to 60 percent slopes	727D	Pappascreek-Monaberg-Mooseflat complex, 2 to 15 percent slopes, stony	932D	Tigeron-Rubick complex, 2 to 15 percent slopes, very stony
537E	Bigbutte-Hungryhill-Poin complex, 8 to 30 percent slopes, very stony	728F	Sebud, very bouldery-Sebud, extremely bouldery complex, 20 to 50 percent slopes	933B	Foxgulch, occasionally flooded-Bearmouth, rarely flooded complex, 0 to 4 percent slopes, stony
540D	Evapo-Germangulch complex, 4 to 25 percent slopes, extremely stony	729E	Maurice, very stony-Sigbird, rubbly-Rock outcrop complex, 8 to 30 percent slopes	935D	Anaconda sandy loam, 8 to 15 percent slopes, moderately impacted
541F	Hungryhill-Euell complex, 20 to 50 percent slopes, very stony	730E	Maurice, bouldery-Sigbird, very bouldery complex, 8 to 30 percent slopes	936B	Foxgulch, rarely flooded-Kilgore, occasionally flooded complex, 0 to 4 percent slopes, very stony
542D	Euell-Hungryhill-Bullrey complex, 4 to 15 percent slopes	731F	Rubick, stony-Worock complex, 20 to 50 percent slopes	939F	Evapo, stony-Tigeron complex, 20 to 50 percent slopes
543F	Evapo-Vitroff-Germangulch, very stony complex, 20 to 50 percent slopes	732D	Maurice-Mawspring-Sigbird complex, 6 to 20 percent slopes, very stony	940E	Ratiopeak, stony-Tiban, very stony complex, 8 to 25 percent slopes
545G	Illiano, very stony-Rock outcrop-Rubble land complex, 45 to 75 percent slopes	734D	Bullrey-Maurice, very stony-Libeg complex, 4 to 15 percent slopes	941E	Bridger gravely loam, 12 to 30 percent slopes, stony
546E	Hungryhill-Euell-Bullrey complex, 8 to 45 percent slopes, stony	737D	Libeg-Bridger complex, 6 to 20 percent slopes	942F	Whitlash-Gnojek complex, 20 to 60 percent slopes, very stony
548F	Evapo-Eastridge-Vitroff complex, 20 to 50 percent slopes	738E	Rubick-Surdal complex, 15 to 35 percent slopes	943D	Bridger-Adel complex, 4 to 15 percent slopes
550E	Evapo-Vitroff complex, 8 to 30 percent slopes	739E	Maurice-Surdal-Mawspring complex, 12 to 35 percent slopes, stony	992	Pits, borrow
551D	Brownsgulch gravely sandy loam, 4 to 15 percent slopes	740F	Tiban-Sigbird complex, 20 to 50 percent slopes, very stony	994	Pits, mine
552E	Nissler-Brownsgulch complex, 8 to 25 percent slopes	741F	Maurice-Sigbird-Surdal complex, 20 to 50 percent slopes, stony	995	Dumps, garbage
554E	Bridger-Poin, very stony complex, 8 to 30 percent slopes	742F	Trimad, very stony-Frenchcreek, very stony-Rubble land complex, 25 to 60 percent slopes	997	Dumps, mine
557D	Savenac-Pappascreek-Mooseflat complex, 4 to 25 percent slopes, very stony	744E	Sigbird, very shallow-Sigbird-Surdal complex, 8 to 25 percent slopes	998	Rock outcrop and Rubble land
559E	Eastridge-Euell, cool complex, 8 to 30 percent slopes	747F	Rubick-Surdal complex, 30 to 70 percent slopes, very stony	M-W	Miscellaneous water
		749E	Surdal-Mawspring, bouldery complex, 8 to 25 percent slopes	W	Water
		750F	Poin, extremely stony-Hungryhill, very stony complex, 20 to 50 percent slopes		
		751F	Sigbird-Tiban-Maurice complex, 20 to 50 percent slopes, very stony		

## CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

### SOIL SURVEY FEATURES

#### SOIL DELINEATIONS AND SYMBOLS



#### STANDARD LANDFORM AND MISCELLANEOUS SURFACE FEATURES

Escarpment, non-bedrock



Gravel pit



Marsh or swamp



Miscellaneous water



Perennial water



Rock outcrop



Wet spot



### CULTURAL FEATURES

#### BOUNDARIES

County



National Forest



Limit of soil survey



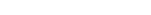
Map sheet neatline



Quadrangle matchline (shown in white)



Public land survey system section boundary  
(shown in white)



#### ROAD EMBLEMS & DESIGNATIONS

Interstate



State



# Symbol Definitions

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LABEL	NAME	DESCRIPTION
AAAAA	Escarpment, nonbedrock	A relatively continuous and steep slope or cliff, which generally is produced by erosion but can be produced by faulting, that breaks the continuity of more gently sloping land surfaces. Exposed earthy material is nonsoil or very shallow soil.
✕	Gravel pit	An open excavation from which soil and underlying material have been removed and used, without crushing, as a source of sand or gravel. Typically 0 to 5 acres.
☙	Marsh or swamp	A water-saturated, very poorly drained area, intermittently or permanently covered by water. Sedges, cattails, and rushes dominate marsh areas. Trees or shrubs dominate swamps. Not used in map units where the named components are “poorly drained” or “very poorly drained.” Typically 0 to 5 acres.
⊙	Miscellaneous water	Small, constructed water area that is used for industrial, sanitary, or mining applications and contains water most of the year. Typically 0 to 5 acres.
⦿	Perennial water	Small, natural or constructed lake, pond, or pit that contains water most of the year. Typically 0 to 5 acres.
▼	Rock outcrop	An exposure of bedrock at the surface of the earth. Not used where the named soils of the surrounding map unit are shallow over bedrock or where “Rock outcrop” is a named component of the map unit. Typically 0 to 5 acres.
↓	Wet spot	A somewhat poorly drained to very poorly drained area that is at least two drainage classes wetter than the named soils in the surrounding map unit. Typically 0 to 5 acres.